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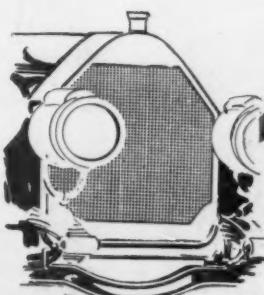
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MOTORAGE

VOLUME XX

CHICAGO, OCTOBER 12, 1911

NUMBER 15



*Look for this new Radiator on
the Maxwell "Special" at \$1280.*

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*With new ventilated
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36-hp. Maxwell, \$1280 (top extra)

You can see this car at any of our 45 branch houses or 1800 dealers. If you have no dealer in your town, write for name of nearest representative. Send for advance catalog and full particulars.

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Every Moon Car is so built that it will pass his personal inspection. Each individual car must be as good in quality and style as the car he himself drives.

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Moon cars are not "cheap" cars. Nor are they **unnecessarily** high-priced.

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But you **don't pay** for expensive frills and fancies that add nothing to the **vehicle-value** of an automobile.

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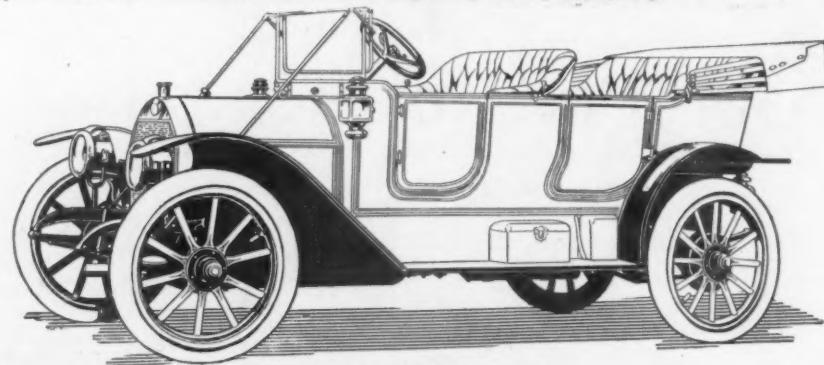
Simply write your name and address—lead pencil will do—and say, "**Send Catalog!**"

You will get by return mail the greatest piece of automobile literature ever printed. It will make you "motor wise" in a single evening.

We will at the same time advise you of the name of the nearest Moon dealer, so that you can **see the car** if you wish to do so.

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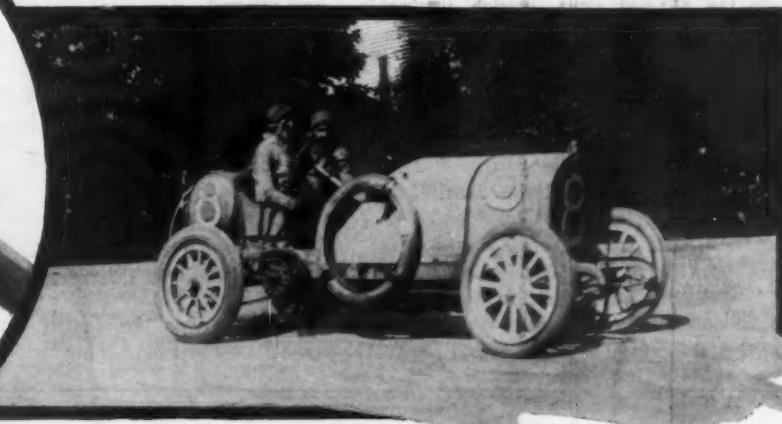
MOTOR AGE

Bergdoll in Benz Fairmount Winner



BENZ WINNING BIG RACE

Mulford in Lozier, Disbrow in National and Hughes in Mercer Capture Class Events in Philadelphia Road Race Meet—Course Record Broken by Benz



ERWIN BERGDOLL—BERGDOLL IN THE WINNING BENZ

STANDING IN SWEEPSTAKES

1—Bergdoll, Benz.....	198:41.35
*2—Wishart, Mercedes.....	200:11.42
3—Mulford, Lozier.....	201:52.78
4—Zengel, National.....	205:59.36
5—Grant, Lozier.....	208:50.37
6—Disbrow, National.....	208:22.32
7—Hughes, Mercer.....	209:45.30
8—Anderson, Stutz.....	220:23.05
9—Herr, National.....	220:33.87

*Disqualified

PHILADELPHIA, Pa., Oct. 9.—The fourth annual Fairmount Park road race, run at a distance of 202.5 miles on Saturday, was won by a foreign car, a Benz with a 6.1-inch bore and a 6.2-inch stroke, and the name of Erwin Bergdoll, a young millionaire who drives for the fun there is in it and who has been in three of the four classics, was added to the roll of honor on which George Robertson twice enrolled his name, in 1908 in a Locomobile and in 1909 in a Simplex, while last year's winner was Len Zengel in a Chadwick.

The race was a most interesting one because of the keen competition and because of the freedom from accident. Records were broken and, to top it all, there has been a protest, which will be followed by an appeal to the A. A. A. contest board. Spencer Wishart, Mercedes, who ran sec-

ond in the general classification and who headed the field in the 451-600 class, was protested by Ralph Mulford, Lozier, who was third in the general race and second to Wishart. Mulford's protest was based on the fact that at one time during the race Wishart did not carry his mechanic. On one of the turns Wishart's mechanic was thrown out and Wishart kept going. Wishart stopped at the pits and picked up another mechanic. The Mulford protest was sustained and Wishart disqualified, but since then the latter has said he would file an appeal, claiming that the violation of the rule was unintentional and that the protest was based on a mere technicality; that he did not notice he had lost his mechanic until he had gotten under way and that the rules forbade him looking back.

Bergdoll in the Benz not only broke the lap record, but his average for the full distance of 202.5 miles, 61.25 miles per hour, is considerably faster than Zengel's mark of 58.1 miles per hour, made last year. Bergdoll's best lap was 7:28.

Sixteen started in the race, nine finished and three others were running, with five winners resulting—one in the cup race



FINISH OF MULFORD, LOZIER, WINNER OF 451-600 CLASS

proper, in which the results are determined regardless of class and in which Bergdoll in the Benz won out, besides winning the 601-750 class; Mulford in the Lozier, who took the 451-600 class through Wishart's disqualification; Disbrow in the National, in the 301-450 class, and Hughes in the Mercer, in the 231-300 class. As summarized, the results were:

The Class Winners

Benz No. 8, driven by Erwin Bergdoll, won the sweepstakes and the class 6C.

No. 17 Mercedes, driven by Spencer Wishart, the same car that raced into a forward position in the 500-mile sweepstakes at Indianapolis on Decoration day, finished second in the general race and first in its class, flashing past the winning line 1:41

ahead of No. 3 Lozier, Ralph Mulford's mount. The Mercedes was protested immediately after the finish for failing to carry its crew throughout and the protest was allowed.

No. 16 National, Disbrow, won the class 4C division from the consistent running Stutz, piloted by Anderson, which went through without a stop.

In class 3C the only car to complete the full course was No. 11 Mercer, driven by Hughes, which made the distance in 209:45.30. When the race was called off the two Ohios were still jogging around, No. 12 having completed twenty laps and No. 19 having finished 22 rounds.

The race was the fourth annual event staged at Fairmount park under the aus-



SPENCER WISHART IN MERCEDES

pices of the Quaker City Motor Club. It was originally scheduled to be held on Saturday, October 7, but a wet and slippery course caused the race to be postponed until Monday. Under the conditions, the event was divided into four classes, coming within the limits of class C.

What They Raced For

To each division winner a prize of \$1,000 will be paid and to the Benz driver goes the sweepstakes prize of \$2,500. In addition to these purses there were the usual number of accessory prizes of various descriptions, the whole amounting to not far from \$10,000.

OFFICIAL RESULTS ACCORDING TO CLASSES IN THE FOURTH ANNUAL 200-MILE FAIRMOUNT

No. Car and displacement	Driver	Division 6-C—Piston Displacement												
		1	2	3	4	5	6	7	8	9	10	11	12	
8 Benz, 730, Erwin Bergdoll....	7:34	15:02	22:41	30:28	38:19	46:02	53:30	61:06	68:48	76:47	84:33	92:31		
Lap time		7:28	7:39	7:39	7:51	7:43	7:28	7:36	7:42	7:59	7:46	7:58		
15 Fiat, 615, J. Fred Betz, 3d....	7:52	15:41												
Lap time		7:49	Out—broken connecting rod											
Division 5-C—Piston Displacement														
17 *Mercedes, 583 S. Wishart....	7:52	15:40	23:30	31:26	39:19	47:12	55:06	63:02	70:57	79:37	87:29	95:14		
Lap time		7:48	7:50	7:56	7:53	7:53	7:54	7:56	7:55	8:40	7:52	7:46		
3 Lozier, 544, Ralph Mulford....	7:55	15:47	23:40	31:34	39:50	47:32	55:23	63:13	70:57	78:48	86:36	94:19		
Lap time		7:52	7:53	7:54	7:56	8:02	7:51	7:50	7:44	7:51	7:48	7:43		
2 National, 589, Len Zengel....	7:51	15:40	27:43	35:38	43:34	51:27	59:15	67:03	74:55	82:59	90:55	98:44		
Lap time		7:49	12:03	7:55	7:56	7:53	7:48	7:48	7:52	8:04	7:56	7:49		
9 Lozier, 544, Harry Grant.....	8:17	16:25	24:34	32:41	40:51	48:58	57:02	65:04	73:08	81:13	89:43	97:18		
Lap time		8:08	8:09	8:07	8:10	8:07	8:04	8:02	8:04	8:05	8:30	7:35		
18 Mercedes, 560, W. Wallace....	8:27	16:41	24:59	33:19	41:31	49:44	57:57	66:07	74:20	84:04	92:29	108:32		
Lap time		8:14	8:18	8:20	8:12	8:13	8:13	8:10	8:13	9:44	8:25	16:03		
Division 4-C—Piston Displacement														
16 National, 447, Louis Disbrow....	8:30	16:46	24:58	33:12	41:24	49:32	57:38	65:42	73:57	82:07	90:15	98:16		
Lap time		8:16	8:12	8:14	8:12	8:08	8:06	8:04	8:15	8:10	8:08	8:01		
10 Stutz, 389.9 Gil. Anderson....	9:09	17:55	26:36	35:24	44:18	53:22	62:18	71:07	80:21	89:20	98:02	106:40		
Lap time		8:46	8:41	8:48	8:54	9:04	8:56	8:49	5:14	8:59	8:42	8:38		
6 National, 447, Donald Herr....	8:38	17:09	25:33	34:04	42:35	51:03	59:16	67:30	75:42	84:00	94:49	103:29		
Lap time		8:31	8:24	8:31	8:31	8:28	8:13	8:14	8:12	8:18	10:49	8:40		
Division 3-C—Piston Displacement														
11 Mercer, 300.6, Hugh Hughes....	8:21	16:27	24:51	33:06	41:15	49:23	57:36	65:51	74:05	82:24	90:39	98:53		
Lap time		8:06	8:24	8:15	8:09	8:08	8:13	8:15	8:14	8:19	8:15	8:14		
5 Mercer, 300.6, Ralph de Palma....	8:20	16:49	25:05	33:22	41:38	49:55	58:11	66:24	74:31	82:37	90:45	98:54		
Lap time		8:29	8:16	8:17	8:16	8:17	8:16	8:13	8:07	8:06	8:08	8:09		
19 Ohio, 299, H. S. Matthews....	9:58	19:54	29:49	39:39	49:23	59:04	68:47	79:00	88:57	98:44	108:24	118:13		
Lap time		9:56	9:55	9:50	9:44	9:41	9:43	10:13	9:57	9:47	9:40	9:49		
12 Ohio, 299, George Parker....	9:29	18:46	27:47	36:49	45:44	54:35	76:43	86:36	94:34	103:34	114:57	123:57		
Lap time		9:17	9:01	9:02	8:55	8:51	22:08	8:53	8:58	9:00	11:23	9:00		
7 Case, 300.7, J. Jagersberger....	8:41	17:22	26:03	34:47	43:21	51:52	60:24	68:51	79:02	87:26	96:04	104:30		
Lap time		8:41	8:41	8:44	8:34	8:31	8:32	8:27	10:11	8:24	8:38	8:26		
4 Cole, 286, Charles Basie....	9:24	18:58	28:22*	37:42	47:39	57:45								
Lap time		9:34	9:24	9:20	9:57	10:06	Out—carburetor trouble							

* No. 17 Mercedes disqualified for losing mechanic

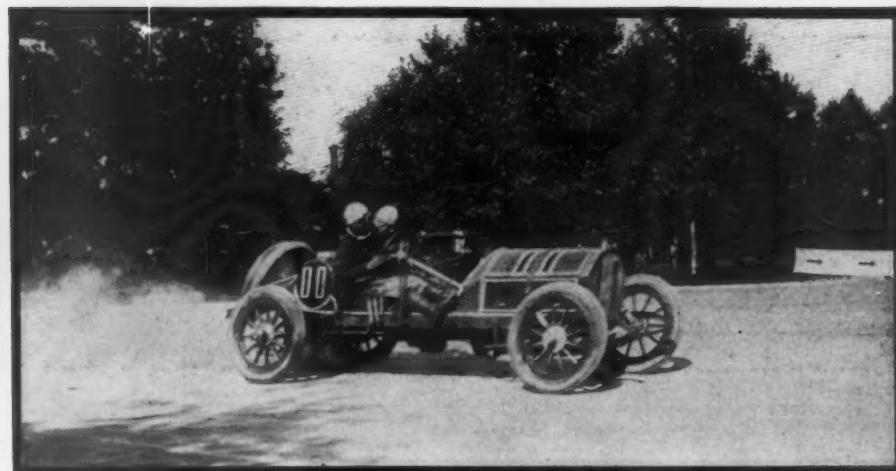


DISBROW, NATIONAL, CLASS WINNER

The subscription for entry was fixed at \$500 per car, and as there were eighteen cars entered, the proceeds of entry amounted to \$9,000. The purses given by the club amounted to \$6,500.

Receipts Probably \$10,000

While the crowd was not nearly as great as in other years, the stands were well filled and it was estimated that the receipts would be about \$10,000 net, after deducting expenses. Under the conditions by which the city of Philadelphia patrols and polices the course, the net receipts from the sale of seats and privileges goes to organized charity.



HUGHES, MERCER, 231-300 CLASS WINNER, AT SWEET BRIAR HILL

The field for this year's race was small in comparison with that of 1910, when thirty-two cars started, and consequently the revenue of the club was much abbreviated. This was the result of several factors, one of the chief being the dispute that arose over who should start the race.

After several heated colloquys with A. A. A., in which ultimatums were passed to and fro, the original choice of the club, G. Hilton Gantert, was selected to officiate once more as starter.

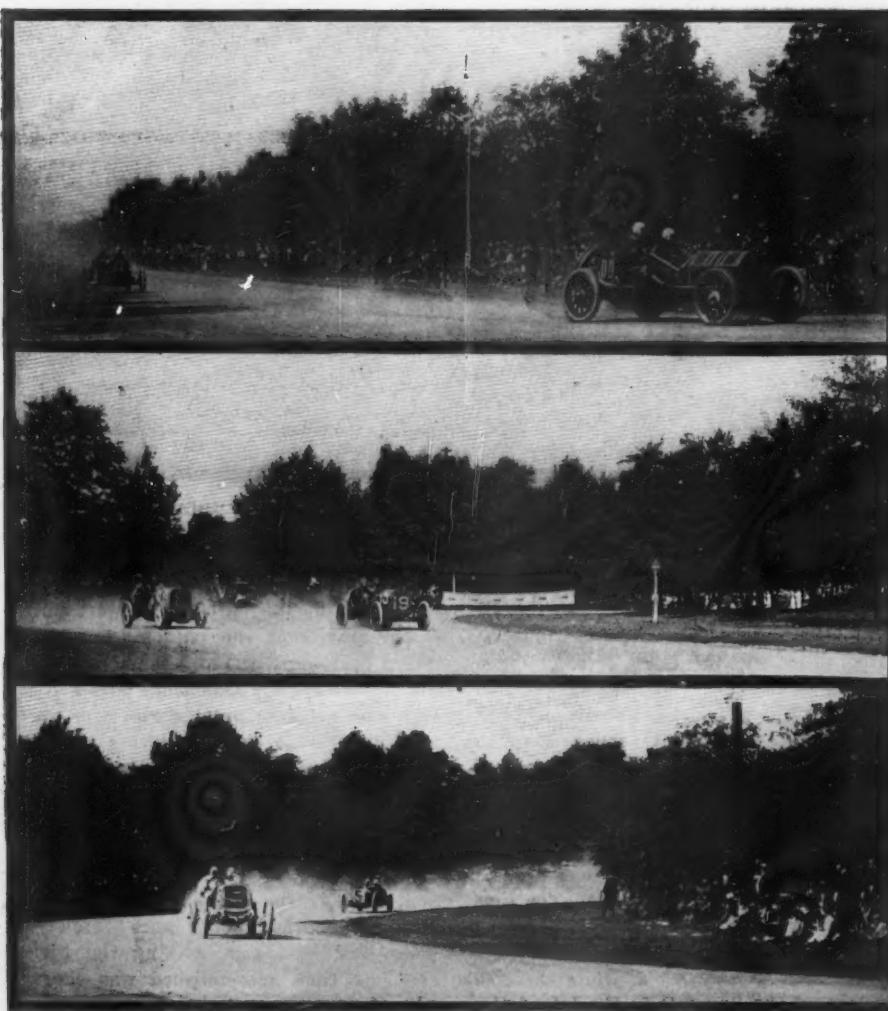
There was very little mechanical difficulty experienced with the cars. The Fiat and Mercer 5 were the only ones to succumb to such. It was functional trouble that put out the Cole, while the sole accident of the day fell to the lot of the

Case. It was plain slowness and tire trouble that ailed the other losers. Only about half of the tire repairs were made at the pits, thus the impression was received that there was an abnormal lack of tire trouble for the Fairmount park course. This was not true because the cars averaged about four changes during the running, but the changes were largely made out of sight of the official stands, where they could not be recorded.

Course Could Have Been Better

The course was not in the best condition, having dried out on top to such an extent that the racing cars threw up dense dust clouds in making the turns. The fast time accomplished was the result of improvement in the cars them-

PARK ROAD RACE, CHIEF HONORS IN WHICH WERE TAKEN BY BERGDOLL IN BENZ



HUGHES IN MERCER AND BASLE IN COLE, AT SWEET BRIAR
BERGDOLL IN BENZ ABOUT TO PASS MATTHEWS IN OHIO
GRANT IN LOZIER LEADING DE PALMA INTO HOME STRETCH

selves rather than to course conditions.

The crowd was rather slow in assembling, but just before noon the seat-holders in the grandstands poured in and when Starter G. Hilton Ganter lined up the contestants, there scarcely was a vacant seat. All around the course the crowds assembled to witness the speed struggle and while the total number of those who

witnessed the race was much below that of last year, it is estimated that at least 350,000 saw the triumph of the Philadelphia car.

The cars were arranged in two lines, the even numbers on the pole and the odds on the rail, and the heads of the columns were sent away at 20-second intervals. F. E. Edwards, chairman of the technical

committee of the A. A. A. contest board, stood at Starter Ganter's elbow throughout this important function. The start was perfect.

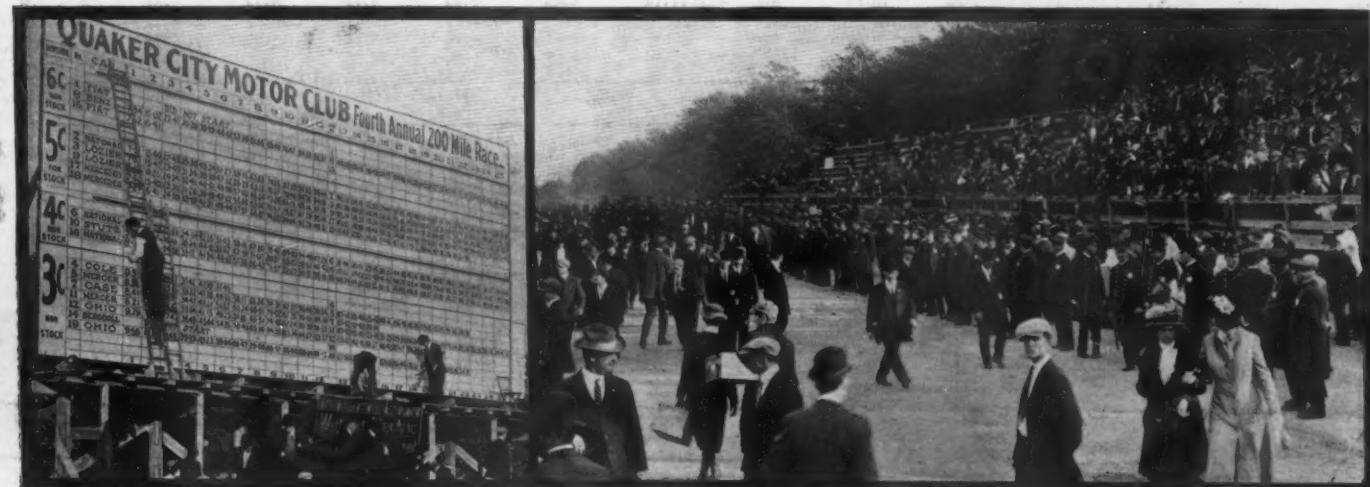
Zengel was first away, followed by Mulford, then came the Basle and de Palma and so on to the end of the line, which was occupied by Matthews in the Ohio. Zengel was the first to appear at the head of the stretch on the initial round and came down to the wire wide open in 7:51, widening the distance between him and the Lozier by 4 seconds on this circuit. But neither of these cars was destined to enjoy a leading position for the round, or, in fact, at any time during the race, as the giant Benz 8 came down to the line in 7:34, lowering the lap record for the course by 4 seconds, even though the standing start would seem to have interposed an insurmountable obstacle to record-breaking. That first swift round foreshadowed the ultimate result of the race, for it was a foregone conclusion after the time was posted that barring accidents there was nothing that could catch the flying leader.

Benz Seems Invincible

From the moment Benz 8 showed in front at the end of the first lap, with an advantage of 17 seconds over the second car, it was a battle merely for position in the classes. But they made a gallant fight and kept shooting at the big car from one end of the race to the other.

Nobody experienced any trouble in the first round, No. 19 Ohio finishing the lap in last place in 9:58 with the other contestants spread out at intervals between that time and the fast performance of the leaders. No. 2 National led for the round in class 5C; National 16 was the pacemaker for class 4C in 8:30, while Mercer 5 was first around in class 3C in 8:20.

The second round was another record-breaker, the Benz negotiating the distance in 7:28, a new course mark, with Mercedes 17 and National 2 tied for second honors. National 16 still led its class, but in 3C Mercer 11 displaced its team mate and showed in front at the



QUAKER CITY'S SCORE BOARD—HOW THEY POLICED THE COURSE



SCENE AT THE START OF FOURTH ANNUAL FAIRMOUNT PARK ROAD RACE

tape. There were no mishaps in this round, everybody finishing without untoward incident.

For the following fourteen laps the Benz stayed out in front, moderating its extreme speed in order to save tires. Mercedes 17 was second for the next half dozen rounds, maintaining its position about 2 minutes behind Bergdoll's mount, with Lozier 3 in third place, a few seconds back.

In the tenth round, however, the Mulford Lozier went ahead of the Mercedes and began a long, stern chase after the leader. For the next six laps the Lozier stayed in second place without cutting down the gap materially. In the seventeenth round both the Benz and the Lozier stopped for tire changes and the Mercedes, which was only a few seconds behind the white car, moved up into pacemaker's position.

Mulford Has Tire Trouble

Bergdoll did not essay to wrest the lead away from the Mercedes in one round, but he kept cutting down the seconds for three laps and at the end of the twentieth lap the black car was again setting the pace. The Mercedes experienced trouble in round 22 and the Lozier stepped up into second place again, only to succumb to a pair of blown tires in the following lap.

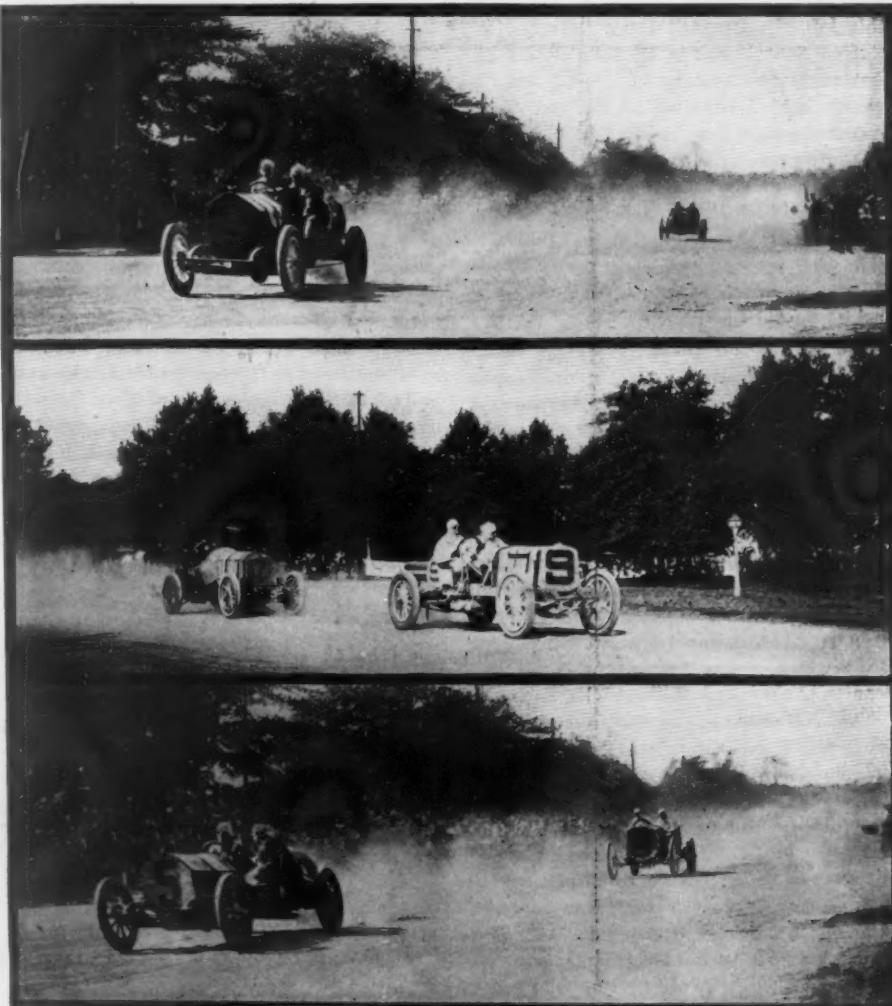
The final round and the finish were not spectacular. Everybody knew that the Benz would win unless it broke an axle and it fulfilled its owner's expectations by making the last lap in 7:38.35, winning rather easily, although by only a moderate margin in 198:41.35. This is faster than the record-breaking performance of the Chadwick last year by more than 10 minutes, which would represent one and one-fourth laps run in reasonably fast racing time.

The Mercedes finished second in 200:11.42, which is in excess of a mile-a-minute gait, but was disqualified for an unusual occurrence during mid-race. Wishart was going fast down the Sweetbriar incline and when he turned into the

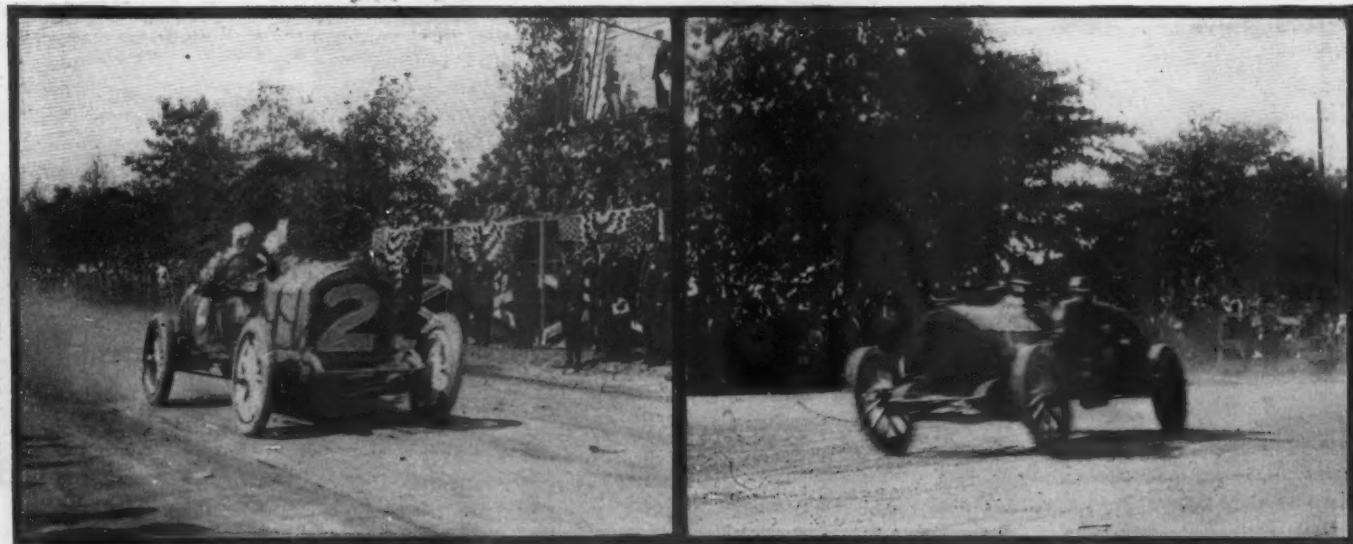
straightaway, just before passing Penn mansion, Bob Willoughby, his mechanic, was unseated by the swerve of the car and fell out upon the roadway. Willoughby rolled out of the course of the racing cars, and Wishart, not to be delayed for a second at that important stage of the race, went on without him. He picked up another helper at the pits and finished the

race as has been told. Willoughby was not seriously hurt.

Under the rules a contesting car in such a race as the Fairmount race must carry a driver and mechanic from start to finish, and when formal protest was lodged with Referee Dunlap, on behalf of the Lozier company, the official promptly allowed the protest, disqualified the Mer-



HERR IN NATIONAL AND HUGHES, MERCER, HAVE A BRUSH
GRANT'S LOZIER LEADING WISHART'S MERCEDES
DE PALMA AND GRANT AFTER LEAVING GRANDSTAND



ZENGEL, IN NATIONAL, FINISHING FIRST LAP

ANDERSON, IN STUTZ, MAKES CONSISTENT SHOWING

cedes and gave the place to No. 3 Lozier. There virtually was no contest in division 6C. Originally three entries were made for this class, including two Fiats of 90 horsepower and the Benz rated at the same power. Fiat 1 was scratched after disapproval had been expressed as to the good taste of starting Lee Oldfield as its driver. This left the Bergdoll Benz and the Betz Fiat to fight it out in the big class. The Fiat made two fast rounds, being only 39 seconds behind its rival at the end of the second circuit. But during the third lap a broken connecting rod caused it to limp up to the grandstand and withdraw. Betz has experienced similar misfortunes before. Last year his mount broke a crankshaft while well up with the leaders, and he was obliged to watch the race from the stand just as he did today.

Fight in 451-600 Class

The prettiest struggle of the race was in division 5C, in which there were five starters. These included a special National, rated at 50 horsepower and driven by Len Zengel, who drove last year's winner, a six-cylinder Chadwick; a pair of Loziets, driven by Mulford, who piloted the second car last year, and Grant, who was at the wheel of the Alco entry which won two Vanderbilt cups, and a pair of Mercedes cars, rated at 90 horsepower, driven respectively by Spencer Wishart, son of the New York millionaire banker, and Willie Wallace.

The National was only prominent for two rounds, when tire troubles intervened and gave it a handicap that could not be overcome. Three different times during the race this car had to stop for tire changes, and each stop occurred at a time when it might have had a chance to displace some of the leaders. It was second in the race and first in its class at the end of the first round, but fell back to third place in the next lap. Then came the tire trouble, which was aggravated by its coming about 2 miles from the pits, causing Zengel to drive slowly for that distance, and this delay, together with the time spent in making the

change, lost something like 5 minutes for the car.

For fourteen rounds the car went along smartly and was within striking distance in round 18 when the tires went bad again and the car was laid under still more handicap. Round 20 found it in trouble again, but Zengel finished smartly in 205:59.36, making the last lap in 7:45.

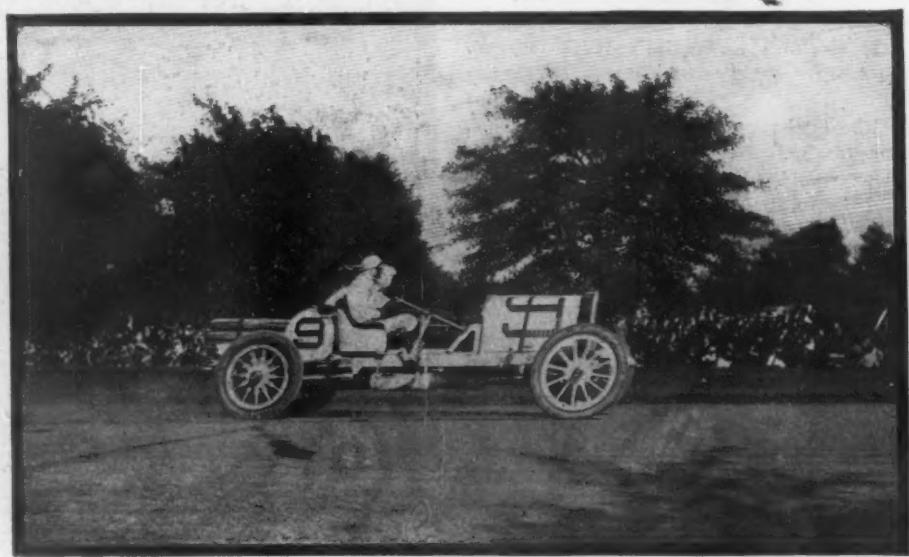
Mulford drove a brilliant and consistent race. The car started at moderate speed and was not placed until three laps had been made. Mulford maintained an average speed of 7:50 per lap for the first twenty rounds. Two rounds during mid-race were run on weakened tires, but the pilot kept going smartly until the Benz waved the distress signal, when both cars went to the pits. Mulford's crew outdistanced the repairmen of the Philadelphia car in making the change, and when the pair returned to the contest the Lozier actually had gained over 1 minute on its rival. This, however, did not serve to improve its position, as the Mercedes had taken full advantage of the tire trouble to dart into the

lead, leaving the Lozier in third place. In round 23 the real, heart-breaking mishap occurred from the Lozier viewpoint, as Mulford was again obliged to change tires dropping back to third place after having wrested second position from the Mercedes in the preceding round. The last laps were negotiated in about 7:40 each, which was not fast enough to get the money.

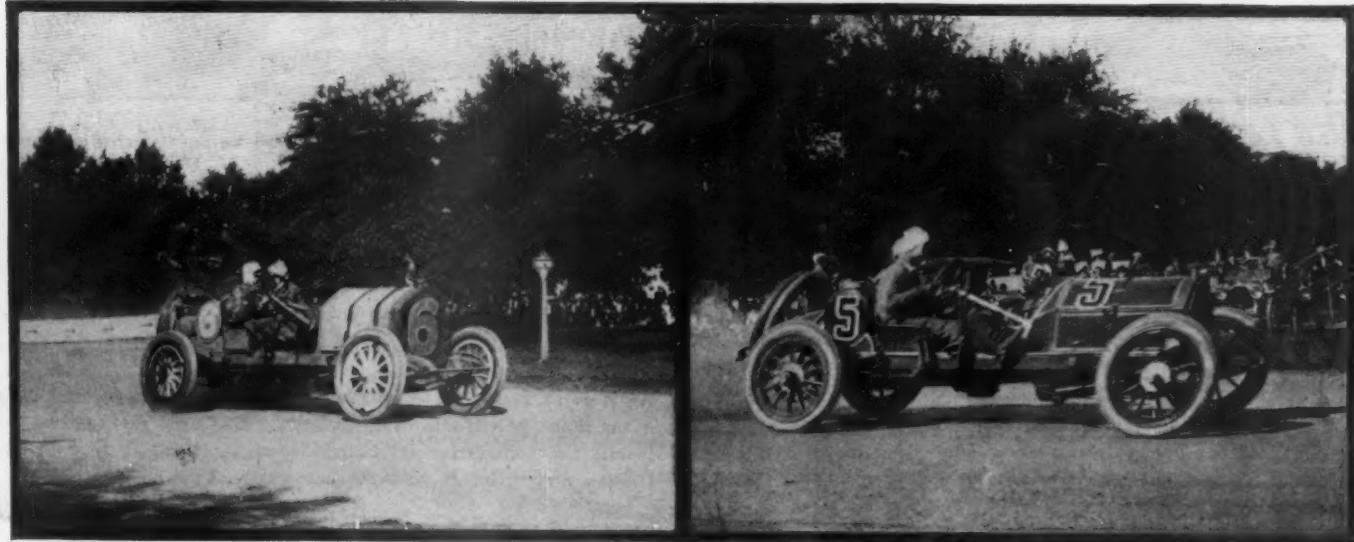
Grant Has Tire Trouble

Grant experienced tire trouble frequently at all stages. In spots his Lozier was estimated to be making 90 miles an hour, which may account for the tire trouble. The car had sparkling speed throughout, but finished over 10 minutes behind the Bergdoll Benz.

Wishart had clear sailing all the way. The car made only one slow round, in lap 22, when tires were changed, making the time for the round 11:14. It was among the first three from start to finish and in lap 18 looked to have a strong chance to beat out Bergdoll's Benz. From there to the end, however, it faded out a trifle and after the mishap to its mechanic was not



GRANT, IN LOZIER, MAKING HIS DASH TO THE TAPE



HERR IN NATIONAL ON HAIRPIN

DE PALMA, MERCER, ON BELMONT ROAD

so sharply driven as in the earlier stages. Its final tie was 200:11.42, which is considerably faster than the time of previous winners of the classic.

Mercedes 18, driven by Wallace, experienced tire troubles and ran through the last ten laps with its engine making signals of distress. No formal reason was given for its poor showing, but it was surmised that either ignition or carburetor was at fault. The car was running at the end, but only completed twenty-two laps.

Disbrow Drives Good Race

In division 4C there were three starters, a pair of Nationals and a Stutz. National 16, Disbrow, jumped away in the lead and was first at the end of each lap to the finish. The car ran smoothly throughout and gradually increased its lead to the end. At no time during the race did it make any prominent bid for the general sweepstakes, but it dashed along with a beautiful certainty under the skilled hand of its pilot. Its time was 208:22.32, just under 60 miles an hour on the general average, and ahead of the winner of the 1910 sweepstakes.

Stutz 10, Anderson, ran an impressive race, never seriously threatening Disbrow's mount, but always shooting at the winner on the long stretches of the course. The Stutz did not have a moment of mechanical trouble and no tire trouble to speak of. It was well handled and its showing attracted a vast amount of attention. It lay in third position in the class until lap 24, when it forged ahead into second place and so it finished. The time of the Stutz was 220:23.05.

National 6, Herr, car and driver the same that won the Illinois cup at Elgin, finished third. Herr followed Disbrow rather closely for twenty-three laps and looked to be surely entitled to second place in the class, when a bad tire change caused him to make a slow circuit in round 24, and the Stutz displaced him. There was a thrilling duel between National 6 and the Stutz in the last rounds, but Anderson had an advantage of 10 seconds in round 24 and maintained it to the wire.

Division 3C had seven entries, including Cole 4, Basle; Mercer 5, de Palma; Case 7,

Jagersberger; Mercer 11, Hughes; Ohio 12, Parker; Bergdoll 14, G. Bergdoll, and Ohio 19, Mathews. No. 14 Bergdoll was scratched before the start and the other, No. 6, formed the field.

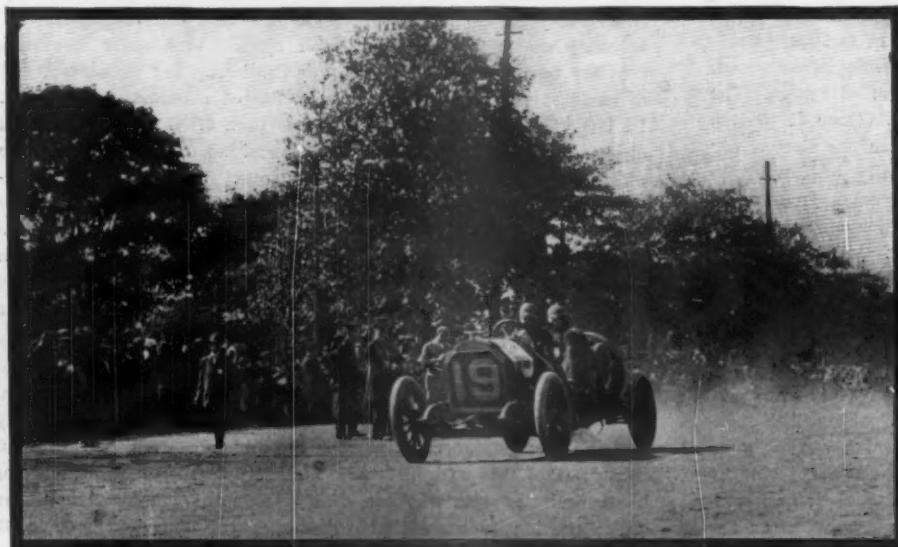
Hughes won all the way and finished all alone in the class. His Mercer was second at the end of round 1, being 1 second behind de Palma's Mercer at that stage. But from the second round to the end Mercer 11 stayed out in front. It had no troubles of any kind, and simply sailed along at a gait that rivalled the Chadwick's time in 1910. The Chadwick is a class 6C car, with more than twice the piston displacement of the Mercer. The final time of this car was 209:45.30.

Showing of the Ohios

Ohio 19, Matthews, was second in this class, finishing twenty-two rounds before the race was stopped. Ohio 19 made a creditable showing from the viewpoints of reliability and speed, but did not show enough of the latter quality to develop anything like a struggle in this class. Ohio 12, Parker, completed twenty laps before the checkered flag announced the finish. It had three very slow rounds, the result of tire trouble far from the pits or stations, but was running well at the finish. Cole 4, Basle, finished six laps at moderate speed when carburetor troubles developed and the car retired from the contest.

Mercer 5, de Palma, looked like the winner of second place in this class for twenty-two rounds, when a broken steering knuckle caused its retirement. The mishap occurred in front of the stands at the end of round 22 and the driver wriggled the disabled car over against the stand after passing the line. For the first fifteen laps this car was only a few seconds behind its teammate.

Case 7, Jagersburger, finished thirteen laps at fair speed and was not completely out of the race when it became unmanageable on Sweetbriar hill and, skidding, struck a post. This resulted in a broken spring and called for the retirement of the car from the race.



MATTHEWS IN NO. 19 OHIO IN 231-300 CL ASS RACE

MOTOR AGE

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Need of Self-Starters

SELF-STARTERS were on the market 5 years ago. At that time many of them gave entire satisfaction. Car owners who had them fitted used them regularly and they claimed that they worked satisfactorily. The value of them was apparent at that time but yet the self-starter did not take. Four years ago many of the biggest European makers fitted them as standard on their cars but yet they did not prove popular. Three years ago they were manufactured but not popularized. It was not until 6 months ago that the big demand for self-starters suddenly made itself felt. The demand came rapidly. Companies that had been fitting them continued to do so but others hurried to install them for the 1912 trade. Now everybody is talking the self-starter; concerns that announced their 1912 lines without them have since then added that they will be stock and are regularly fitting them. In a word, the era of the self-starter has arrived.

THE coming of the self-starter was not unlike that of the pneumatic tire. The tire had been in use for years before it was generally adopted. Finally, when the proper time came, the time when the public was ready for it, then everybody wanted it. It has been with us ever since. It is questionable what led to the general taking up of the self-starter at this particular season. With some of the companies it was a case of adding something by way of extra equipment for the new model. Some concerns did not drop the price of the 1911 line for 1912, while others raised it. Not much could be done by adding extra equipment, and so the self-starter was looked upon as a possibility.

THE advent of the self-starter also is partly due to the trend towards electric lighting. Many makers have turned their attention to electric lighting and have quite naturally reached the conclusion that the instrument that generates current for the ignition also might generate for the electric light and perhaps also for a self-starter. This line of reasoning would suggest the adoption of some form of electric starter. No matter what type of starter is going to come, it must be acknowledged that the day of the self-starter is here. The cars will be showing them in great numbers by show times, and those concerns that have not fitted them will have done a good deal to facilitate starting cars in winter time by the addition of hot air intake pipes, waterjackets, hot air jackets or some other form of heater. The self-starter is one thing that is badly needed. Once it arrives it will place the gasoline car on an equality with the electric car for use by women in city traffic. The necessity of having to crank a gasoline motor has kept hundreds of women from using the gasoline car. The cranking problem has also stopped many owners from driving their cars in cold weather.

THE self-starter is bound to exhibit considerable versatility of design at the start. There are a score or more of inventors and manufacturers who want to try out their particular design, and until the weaker ones are weeded out and the ascendancy of the stronger ones acknowledged, anything looking like standardization need not be expected. The evolution period must be passed through. At present there are various types, including the electric, the compressed-air design, the spring type, and combinations of these. All of them have been designed after the car and it will be more or less of a blacksmith job to put them onto the different make of cars. The self-starter should be an

integral portion of the motor and the concern building the motor should build the self-starter. It would be quite absurd for a concern building a motor to buy a compression-release device for use on the camshaft from another concern. So with the self-starter. It should be an integral portion and not an afterthought. As it is at present it costs more to attach some self-starters to a car than the self-starter costs itself. The only proper time to install the self-starter is when the car is being built. It is cheaper and better if done at such a time.

HERE are many car makers who will not have self-starters for the 1912 season, but who are working to improve the starting qualities of their cars. Some of these consist in fitting hot-air horns and tubes to the carburetor air intake; others take the form of compression releases acting on the exhaust valves, which make cranking easier, and others combine the compression release with a priming arrangement whereby gasoline is sprayed into the intake manifold. One other maker has gone still further and is going to fit into the carburetor a coil through which an electric current will pass, and this current will immediately vaporize the gasoline in cold weather. The net results of all of these divers efforts is that the day of the self-starter has arrived; the day of fractured arms from back-kicks should soon be over; the day when it will be possible for an owner to take his car to the theater and start it after the show without making an exhibition of himself trying to crank and lifting the bonnet to prime his motor, should be over; the day is coming when a woman can take a medium-sized gasoline car out and stop and start it without having to get assistance from others; and the day is here when every hustling maker will have to provide some rational form of starter and furnish it as stock equipment and not as an extra.

Boosting the Fall Trade

THE wise business man works hard in dull times. When business is good sales come without effort. It does not call for that sterling quality of salesmanship on the sunny day in spring that is needed in the gloomy October weather. The biggest pressure is needed in the dullest times. Motor car dealers in many cities are recognizing this. They are taking different means of boosting the dull days. In small cities where state fairs are held the tent offers a good field for exhibiting the motor car, and often if sales are not made a good list of prospects is obtained. In larger cities the opening week has been tried with the avowed object of getting names of prospects. No matter what the means employed the object is a good one. There are always several dull months previous to show times, and if these can be brightened up a little, a few sales made and a big list of prospects obtained, the time, money and energy expended have been well spent. Chicago is trying the experiment this week and it is being watched with no little interest. If the dealers make good other cities will take it up in future years.

OF course there necessarily must be considerable educational work done to draw the people to these fall shows. Simply putting new cars on view is not enough of an attraction to interest many; the dealers must adopt different tactics—lectures for instance by experts who can discourse on the construction of the cars; moving pictures that will be educational; old models of cars which will show the progress of the industry, etc. The dealers must depart from the conventional to get the crowds.

Talks Tires; Adopts Screw Standard

NEW YORK, Oct. 9—At the meeting of the division on wheel dimensions and fastenings for tires of the standards committee of the Society of Automobile Engineers held at the office of the society on October 5 the S. A. E. committee met representatives of various tire concerns. The first subject taken up was the matter of a standard bolt hole circle for the flange type of solid motor tire. It was the sense of the meeting that the S. A. E. committee be requested to recommend the adoption of $\frac{1}{2}$ inch as the diameter of a through-bolts for all sizes of solid motor tires. Also that the diameter of the bolt hole circle for 36-inch tires should be 28 $\frac{1}{2}$ inches, and increase or decrease by even 2 inches for tires larger or smaller than 36 inches.

As to the number of bolts to be used, it was the sense of the meeting that for tires up to and including 36 inches diameter there should be eight, twelve or twenty-four bolts equally spaced where required; for tires above 36 inches and up to and including 42 inches there should be ten, fifteen or thirty bolts equally spaced where required; for tires above 42 inches and up to and including 48 inches there should be twelve, eighteen or thirty-six bolts equally spaced where required, and for tires above 48 inches and up to and including 54 inches there should be fourteen, twenty-one or forty-two bolts equally spaced where required.

There was considerable discussion on the subject of the tolerance in circumference of the permanent metal band on the S. A. E. standard truck wheels. On this point the S. A. E. committee has for the time being reserved its opinion on reconsideration.

The next subject taken up was the matter of standardization and grading of woods for artillery wheels for motor cars. Arthur Ryan, of Crane & MacMahon, Inc., New York city, addressed the meeting on this subject. There also was submitted a paper by W. P. Kennedy entitled "Seasoning of Timber for Wheels." Further data will be collected on the subject of wheel wood standardization, it being appreciated that the work in this connection is difficult.

The meeting recommended that the S. A. E. be requested to consider metal wheel dimensions in so far as they relate to the application of side flange tires.

It also was voted that the manufacturers of commercial motor vehicles should be requested to inspect the wheels which they purchase according to S. A. E. standards and to mark the same with a symbol visible at all times in the life of the wheels, indicating that they comply with the S. A. E. standard's dimensions.

At the conclusion of the meeting William E. Metzger, president of the National

Association of Automobile Manufacturers, was present, and the work of the Society of Automobile Engineers in the matter of truck wheel standardization was fully outlined. President Metzger in turn expressed the gratification of the manufacturers as to the S. A. E. standardization work and the belief that they would fully support the particular standardization under consideration at this meeting, namely, the truck wheel having a constant diameter for all widths of solid motor tires of a given diameter, and a per-

manent metal band of $\frac{1}{4}$ inch thickness for some sizes and $\frac{3}{8}$ inch for others, the idea being that this metal band never should be removed from the wheel under any circumstances, but remaining as the common basic point from which all the makers of solid tires are to work, all special steel equipment necessary to the application of the respective makes of solid tires being attached to the outside of this permanent metal band.

The interchangeability of tires of different makes so much desired is brought about by simply removing, in case of a change, the steel parts peculiar to a displaced tire, the wheel being left in its original condition with the permanent metal band attached. In case a side wire type of tire is displaced the channel is removed; in case a tire vulcanized to a metal ring is displaced the special wheel band is removed—in either case leaving the permanent wheel band intact.

The Society of Automobile Engineers has just announced the details of the S. A. E. screw standard which supplants the A. L. A. M. screw standard, which was adopted by the Association of Licensed Automobile Manufacturers in April, 1906. This work the Society of Automobile Engineers undertook and in conformity with the policy of changing the name of an A. L. A. M. standard, whenever amended by the S. A. E., henceforth the predominant machine screw standard will bear the initials of the society of the designers and producers of American motor cars. The only changes which have been made by the S. A. E. in the old standard are as to the distance across flats of the heads and nuts of the $\frac{1}{4}$, $\frac{7}{16}$ and $\frac{3}{8}$ -inch screws, the changes being from $\frac{3}{8}$ to $\frac{7}{16}$ from $11/16$ to $\frac{5}{8}$ and from $1\frac{1}{8}$ to $1\frac{1}{16}$ inch respectively.

The A. L. A. M. screw standard did not go beyond 1-inch diameter screw. The S. A. E. standard proceeds by one-eighth's to and including 1 $\frac{1}{2}$ -inch diameter screw. The grounds of the society's action were as follows:

1.—That the diameters of the heads conformed to those theretofore established for regular screws.

2.—That screws of these proportions can be produced with so little change of the machines making regular goods that it is easy to maintain a stock or furnish them with little delay if not in stock.

3.—That the sizes of material, being regular, are ordinarily kept on hand in large quantities.

4.—That the nuts can be made from steel bar or from regular cold punched blanks under the same advantageous conditions that apply to the manufacture of screws.

5.—That replacements can be made by garage repair men in case of emergency from screws and nuts purchased locally, which can be used as bought or rethreaded S. A. E. standard. In either case the wrench in the regular equipment fits the replacement screws and nuts uniformly with those already on the vehicle.

6.—That the diameters of heads and nuts agree with the dimensions of the ordinary cap screws and cold punched nuts used in the less important places of many of the component parts of various manufacture that enter into the construction of the motor vehicle. This uniformity certainly lessens the number of and facilitates the use of wrenches in making adjustments and repairs.

October 7-14—Fall opening of Chicago Automobile Trade Association.

*October 9-13—Reliability run of Denver Motor Club.

October 11-18—Six-day endurance run from San Francisco to Los Angeles and return.

October 12-13—Track meet, Peoria, Ill., Peoria national implement and vehicle show.

*October 14—Santa Monica road race, Los Angeles, Cal.

October 14-26—Glidden tour, New York to Jacksonville.

October 20-21—Track meet, Sioux City, Ia.

October 21—Track meet, White Plains, N. Y.

October 21—Minneapolis hill-climb.

*October 27-November 3—Eight-day reliability run of Chicago Motor Club.

October 28—Reliability run, Newark, N. J.

October 30—Economy run of Motor Club of Harrisburg, Pa.

October 31—Track meet, Shreveport, La.

November 2-3-4—Reliability run of Quaker City Motor Club, Philadelphia.

November 3-4—Track meet, Columbia, S. C., Automobile Club of Columbia.

November 3-11—England's annual Olympia show.

*November 4-6—Phoenix road race, Maricopa Automobile Club.

*November 9—Track meet of Maricopa Automobile Club, Phoenix, Ariz.

November 9-11—Track meet, San Antonio Automobile Club.

November 20-24—First American road congress at Richmond, Va., under auspices of American Association for Highway Improvement.

November 22—Start of 11-day around-Georgia tour.

*November 27—Vanderbilt road race, Savannah, Ga.

November 30—Grand Prix race, Savannah, Ga.

January 6-13—Twelfth annual show, pleasure car division, Automobile Board of Trade, Madison Square garden, New York.

January 6-20—Madison Square Garden show, New York City, Automobile Board of Trade.

January 10-17—Annual show, Motor and Accessories Manufacturers, Madison Square garden, New York.

January 10-17—Annual show, National Association of Automobile Manufacturers, Grand Central Palace, New York.

January 15-20—Twelfth annual show, commercial division, Automobile Board of Trade, Madison Square garden, New York.

January 18-20—Annual meeting Society of Automobile Engineers, New York.

January 27—February 10—Eleventh annual show under the auspices of the National Association of Automobile Manufacturers, Coliseum, Chicago.

February 19-24—Show at Hartford, Conn.

February 14-17—Show at Grand Rapids, Mich.

March 2-9—Pleasure car show, Boston.

March 13-20—Show of Boston Commercial Motor Vehicle Dealers' Association, Mechanics' building, Boston.

*Sanction already issued



Savannah Promises Record Entry List

Georgians Anticipate More Than 100 Cars for Grand Prix, Vanderbilt And Other Events Next Month—Additions to Cash Prizes Made—Meet To Be Object Lesson in Roads

SAVANNAH, GA., Oct. 9—Following his return from New York, where he had a conference with Fred Wagner, starter for the Savannah races the last week in November, President Harvey Granger, of the Savannah Automobile Club, says he believes there will be 100 cars entered in the grand prize, Vanderbilt, Savannah challenge trophy and Tiedeman cup races.

The grand prize is to be run on Thanksgiving day, November 30, and the other races run together on Monday, November 27. The manufacturers who have given assurances so far that they will enter and the number promised are as follows: Lozier, two; Abbott-Detroit, four; Mercer, three; Cole, two; Ohio, two; Marmon, four; Fiat, six; Benz, three; Buick, two; Pope-Hummer, two; Mercedes, one; Sears, three; Opel, one; Colby, three; Staver, three; Metallurgique, one; S. G. V., one; Case, two; Ford, undetermined; Westcott, undetermined, Velie, undetermined.

Many other manufacturers are corresponding with the officials of the Savannah club with a view to the entry of cars in one of the four races in a manner appearing to bear out the assumption of President Granger that there will be 100 cars here for the races in the largest aggregation of racing cars ever gathered on one course in America.

De Palma to Drive a Lozier

The latest information received is that Joe Jagersberger and J. D. McNay will drive the Case cars which have been entered in the Savannah challenge trophy race. Ralph de Palma will drive one of the Mercer cars and will also drive a Lozier in the grand prize. Spencer E. Wishart will drive the Mercedes. Bob Burman will drive a Marmon in the Vanderbilt. Burman starts for Germany this week to get his grand prix Benz and also to try to get the 300-horsepower Opel in which he intends trying to beat his own straightaway mile record.

The Savannah Automobile Club has added \$1,500 as second and third prizes in the Vanderbilt and the two light-car races, making the total amount of prize money offered by the club \$11,000. In addition to these cash prizes is the \$5,000 grand prize cup, the Vanderbilt cup, and other valuable plaques to go to the winners. The Remy Magneto Co. has led off for the accessory concerns with an offer of \$4,700 in cash prizes, and other tire, oil and accessory manufacturers have signified their intentions of offering as substantial cash amounts to the winners, until the lucky drivers will carry off good sized money bags.

One of the practical benefits which will come out of the holding of the great road races in Savannah in November will be the road instruction and information to be given road commissioners of the United States east of the Rocky mountains.

Arrangements have been made to have these in Savannah in force, and the county authorities are arranging to give them object lessons in road building and preservation which should have an appreciable effect on the quality of roads in many sections of the country hereafter.

Will Inspect the Roads

The arrangement to bring the road commissioners to Savannah includes the presence at the time of Director Page of the bureau of roads of the United States department of agriculture. The opportunity for the road experts has been brought about by the Indian Refining Co., which has for the last 2 years oiled the Savannah course. This year the company is so proud of its work and so confident that the running of the races will see all world's records for road racing eclipsed that it has decided to have the road builders of the country here to see the performance made on roads oiled by it.

The visitors will be brought in special cars from New York, Atlanta and other points where they will gather and make up parties. While in Savannah the road experts will have the opportunity to hear from Director Page of the bureau of roads, to exchange ideas with each other and have an object lesson in building the several kinds of roads which have made Chatham county famous.

RACING AT SPRINGFIELD

SPRINGFIELD, Ill., Oct. 9—The races on Saturday, the closing date of the Illinois state fair, served to draw out the largest crowd of the week with the appearance of Bob Burman, Ray Harroun, Jay McNay, Heineman, Kilpatrick, McFadden, Knudson and Monckmeier as the drivers of the day. There were only three real races in the entire card, the pursuit, the special race for the club championship and the 5-mile battle between the two Staver-Chicagos and the Case. McNay drove a great race in the Illinois club championship, winning the \$600 trophy for the Springfield Automobile Club from Monckmeier in his Staver-Chicago, representing the Chicago Motor Club, after Wonderlick, representing Bloomington in a Buick, had dropped out in the second mile. Heinemann, driving a Case, defeated Monck-

meier in the 5-mile race, with Knudson, also in a Staver-Chicago, third. Summaries of the meet:

Two-mile match between Ray Harroun in the Marmon Wasp and Clifford Turpin in a Wright bi-plane—Won by Harroun. Time, 2:48 $\frac{1}{4}$.

Two miles—Monckmeier, Staver-Chicago, won; Knudson, Staver-Chicago, second. Time, 2:22.

Three-mile exhibition by Ray Harroun, with tire change at end of second mile. Time, 3:28. Time of tire change, 54 $\frac{1}{2}$ seconds.

Eighth-mile slow race, care running on high gear—Won by a Thomas six. No time taken.

Three miles handicap—Ray Harroun, Marmon Wasp, scratch, won; Heinemann, Case, $\frac{1}{2}$ mile handicap, second. Time, 3:25.

Australian pursuit race, limit of 10 miles—Won by Kilpatrick, Hotchkiss. Time for 8 miles, 8:45 $\frac{1}{2}$.

Five miles, class C nonstock cars, 300 cubic inches and under—Heinemann, Case, won; Monckmeier, Staver-Chicago, second; Knudson, Staver-Chicago, third. Time, 5:38 $\frac{1}{4}$.

Three miles free-for-all—Burman, Mercedes, won; Kilpatrick, Hotchkiss, second; McNay, Prince Henry Benz, third. Time, 2:52 $\frac{1}{4}$.

Five miles, Illinois club championship—McNay, Prince Henry Benz, representing Springfield Automobile Club, won; Monckmeier, Staver-Chicago, representing Chicago Motor Club, second. Time, 10:21 $\frac{1}{4}$.

One mile time trials—Burman, Mercedes, :54 $\frac{1}{2}$; Kilpatrick, Hotchkiss, :56 $\frac{1}{2}$.

Five miles, free-for-all handicap—Monckmeier, Staver-Chicago, 50 seconds handicap, won; Knudson, Staver-Chicago, 50 seconds handicap, second; Kilpatrick, Hotchkiss, 15 seconds, third. Time, 4:29.

PORTLAND-SEATTLE RECORD BROKEN

SEAUL, Wash., Oct. 7—The record between Portland and Seattle has been broken by a Mitchell runabout which won the Chanslor & Lyon cup. The time was 9 hours 57 minutes; distance 207 miles. The run was made after 4 days' rain which developed road conditions the worst known in years.

COLBY A WINNER AT OMAHA

OMAHA, Neb., Oct. 9—The rain has proved the most consistent winner in the races at the Omaha speedway. The races originally were scheduled for September 30, October 1, 2 and 4. They had to be postponed twice, but finally the first day's events were pulled off last Wednesday. The second day's races were to have been held Friday, but again the rain interfered.

Pearce, in a Colby, carried off every contest he was allowed to enter on Wednesday in some of the fastest driving ever witnessed on this track. In the 10-mile race for cars under 231 cubic inches displacement the Colby was barred, and the Firestone-Columbus and Abbott-Detroit fought for first place throughout, the former winning by a quarter of a second. In the first race the Colby was followed closely by the Firestone-Columbus and the Abbott-Detroit, but won the last easily. Summaries:

Ten miles, 231 cubic inches and under—Pearce, Colby, won; Ed. Rickenbacher, Firestone-Columbus, second; William Bruner, Chalmers, third. Time, 10:09.

Ten miles, under 231 cubic inches—Rickenbacher, Firestone-Columbus, won; time, 11:47 $\frac{1}{2}$. Smith, Abbott-Detroit, second; time, 11:48. Bruner, Chalmers, third. Withdrawn, Paige-Detroit.

Twenty-five-mile free-for-all, for speedway cup—Pearce, Colby, won; time, 24:52 $\frac{1}{4}$. Rickenbacher, Firestone-Columbus, second. Smith,

Santa Monica Road Races Well Filled

Abbott-Detroit, third. Paige-Detroit withdrawn in fifth lap.

In a speed test the Colby made 5 miles in 4:48.

The other races in Omaha had to be postponed again until Sunday. Pearce in his Colby 40 again carried off the honor, winning the Speedway cup. Summary second day:

Fifty-mile free-for-all—Pearce, Colby, won; time, 48:45½. Ernest Delaney, Cutting, second; time, 1:23. Firestone-Columbus, and Baker, Mercer withdrew.

Five-mile speed trials—Pearce, Colby, time 4:44; Delaney, Cutting, time 5:21½; Rickenbacher, Firestone-Columbus, time 5:24½.

Obstacle race, 10 miles—Baker, Mercer, won; time, 19:09½; Bruner, Chalmers, second.

MISSOURI SETS DEDICATION DATE

St. Louis, Mo., Oct. 9—The Missouri state highway, connecting St. Louis and Kansas City, a distance of about 300 miles, is to be dedicated by a ceremony held at Columbia October 21. Governor Hadley, who made a motor trip along the route when it was selected, has invited the governors of Kansas, Colorado, New Mexico and Illinois to be present. Members of the Automobile Club of St. Louis also will be present, in addition to a large number of motorists from all parts of the state. The St. Louis delegation will make the trip in motor cars, starting from the club's rooms the morning of October 20 and arriving at Columbia the next day, with an all night stop at Fulton. State Highway Engineer Curtis Hill reports much progress in the building of the road. Already \$350,000 has been voted for this purpose by three of the counties along the way, and there are assurances that before spring more than \$1,000,000 will have been appropriated for the purpose of building the road. The work of grading and building permanent culverts now is in progress. The highway follows the historic old Santa Fe trail to a large extent.

MUCH MONEY FOR ROADS

Grand Rapids, Mich., Oct. 9—The estimate cost of the improvement of 152 miles of roadway in all parts of the county, under the direction of the county good roads commissioners and County Surveyor Williams, will be \$450,000. The profiles, plans and specifications and estimates of cost of the improvements have been completed by Engineer Williams, and from present indications every mile of highway to be improved will cost the county in the neighborhood of \$3,000. The average cost per mile for the improvement in this county is less than the cost of similar improvements in any of the surrounding counties, this fact being accounted for by the great abundance of gravel available for the improvements, while in other counties it has been necessary to purchase crushed stone to make the improvements.

At Least Forty Starters Anticipated in Four Events To Be Run Saturday—New American Record Expected Because of Course and Class of Cars That Are Entered in the Contests

LOS ANGELES, Cal., Oct. 6—Forty entries are promised for the third annual Santa Monica road race, to be run Saturday, October 14. There will be four events run in three races. Starting at 8:30 the little cars will be sent away for 100 miles, making twelve laps of the course, which measures 8.417 miles. Next the entries in the medium-car class and the heavy-car class will be sent away together. In the afternoon the free-for-all will be started. The second event will be for 151 miles, and the last race for 202 miles. Piston displacement is the only classification in the first three events, all of which will be non-stock. The cars will be classified as follows: 230 inches and under for the mosquito fleet, 231 to 300 for the medium cars, and 301 to 450 cubic inches for the heavy-car class.

New Record Expected

Heading the entry list in the free-for-all is a Fiat 90, to be driven by Teddy Tetzlaff, who set a new American road record last year on the same course with a Lozier. His average for the race was 73.27 miles per hour. It is predicted that this will be beaten this year, as the course is considered faster, and many of the drivers feel confident that they can get more speed out of the cars that they will drive this year. The winner of the first Santa Monica race, Harris Hanshue, is entered with a Mercer. Bert Dingley has bought the Pope that he drove into first place in the Oakland Portola road race last February, and will drive it in the heavy-car race as well as the free-for-all. Harvey Herrick, who took first place in the Los Angeles, Phoenix race in November, will start a National in the free-for-all and heavy-car events.

These western drivers will be pitted against such drivers as Wilcox, Merz and Aitken, of the National team, Dawson, Patschke, Joe Nikrent and Bruce Keene with their Marmons, Disbrow in the Ohio, Dave Lewis with the Stutz, T. S. Duby and the Midland six, and Harry Endicott with the Inter-State.

The entries in the 301- to 450-inch class will include a Pope, a Stutz and two Nationals. Most of the eligibles for this class are held in reserve for the free-for-all, with its larger purse and finer trophy. The cars ranging from 231 to 300 will run simultaneously with those of the next larger size. In this event are two Coles, with Johnny Jenkins and Frank Siebert driving; a Mercer, with Hanshue at the wheel, two Marmons to

be driven by Joe Nikrent and Bruce Keene, a Buick with Louis Nikrent up, the Ohio with Disbrow as pilot, a Lexington with Bigelow, and the Durocar with which McKeague won his class last year and with which he will try to repeat. In addition a Parry and a Schaeft have been promised.

The midget list is headed by Clarence Smith and the Maxwell that carried off the light-car prize last year, Harris Hanshue in a Reo, Frank Charle and his Ford, Frank Siebert at the wheel of a Paige-Detroit, Anthony with a Regal 20, and Louis Nikrent with one of the little Buicks. In addition a Flanders and E-M-F are expected to run. Harris Hanshue is entered to drive in all three of the races, which make a total of 450 miles for the day's work. Dingley, Siebert, Joe Nikrent and Harvey Herrick will compete in two out of the three races.

Most of the local cars are ready for the road tests which will begin when the course is opened for practice tomorrow morning. The National team with its cars are here and have established a camp at Santa Monica, near the course. The Marmon cars and team are enroute and due to arrive on the 10th. The course requires very little more work to be put in excellent shape, and repairs necessary after practice will be made every day. The grand stand, with a capacity of 10,000, is ready and all arrangements for patrolling the course with a company of militia have been completed. Fred J. Wagner will be here to start the cars, next Saturday, having acted in that capacity last year.

Four Trophies Offered

Four big silver trophies are offered: The Dick Ferris trophy to the winner of the free-for-all, the Leon T. Shettler trophy in the heavy-car class, and two new cups donated by Chanslor & Lyon and J. A. Jepsen for the medium and light-car classes. In addition over \$10,000 in cash will be divided among the winners. Part of this is offered by tire and ignition firms to winners' cars using their equipment. This has aroused the interest of the drivers.

MORE CHICAGO ALLOTMENTS

New York, Oct. 7—Eight car concerns will occupy space in the Coliseum annex during the Chicago show, allotments having been made to the Alco, Cole, Glide, Elmore, Baker electric, American and Ohio electric.

Chicago Dealers Hold Fall Opening

CHICAGO, Oct. 9—Chicago is trying an experiment this week which, if successful, will be copied by other cities. Affairs somewhat similar to it have been held, but no other city has such a stage as is afforded by the local motor row, 2 miles in length. The experiment is the fall opening of the Chicago Automobile Trade Association, which has taken the form of a combination outdoor and indoor display. The exterior of the show consists of Michigan avenue, decorated at night by countless numbers of incandescents strung crosswise of the street and with handsome lighted posts at each corner. The light gives one the impression of traveling through a covered street, the canopy being a blaze of light. The stores are decorated uniformly with autumn leaves, potted palms and flags and taken as a whole the row looks good.

Nearly every concern has on view the 1912 models and every effort is made to bring out the crowds at night, when the stores are kept open until 10 o'clock, the idea being to get the names of prospects who can be worked on during the dull months of winter. To encourage the people to visit the row the trade association is running a trackless trolley made up of demonstrating cars which carry spectators from one part of the row to another, provided they secure tickets from some agent, who takes the name before handing out the pass.

Not more than half a dozen dealers refused to go into the show and the fund for lighting the street was raised by assessing each agent on his frontage which gave a war fund of something like \$7,000. In addition to this the dealers are advertising liberally in the daily press, the result of the combination being that Saturday night, when the affair started, a big crowd was attracted. The first night's experience delighted the dealers, who at first were somewhat dubious as to the

MICHIGAN AVENUE DECORATED AT NIGHT BY STRINGS OF ELECTRIC LIGHTS, AND NEW MODELS ARE SHOWN—CELEBRATION OF FIRE ANNIVERSARY PROVES TO BE FEATHER IN TRADE ASSOCIATION'S CAP

value of the fall opening. The people were puzzled at first as to how to take advantage of the trackless trolley, but that soon will wear away.

The trade association unwittingly hit upon the biggest kind of a publicity stunt when it arranged to celebrate Chicago day in an original manner. Today is a celebration of the fortieth anniversary of the famous Chicago fire, so the dealers arranged a big parade this afternoon in which the firemen and police participated and which includes all sorts of fire-fighting apparatus. Tonight there was a reproduction of the start of the Chicago fire, the affair taking place on the lake front. The O'Leary cow shed was set on fire by Mrs. O'Leary's cow and motor-driven fire apparatus responded to the alarm and extinguished the flames. The Chicago Historical Society aided in the affair and the result was that the show has received publicity which it could not have gotten any other way. The show will end next Saturday night. In addition the Trade association gave a luncheon to the veteran firemen, both volunteers and regulars, who helped fight the Chicago fire.

ST. LOUIS SHOW A SUCCESS

St. Louis, Mo., Oct. 9—The directors of the outdoor show held at Forest Park Highlands October 2 to 7 report that it was a great success financially, the attendance exceeding the figures of the last show held by the St. Louis Manufacturers' and Dealers' Association by about 30 per cent. This organization did not hold the show in the Coliseum last February. The dealers are especially pleased with the large number of out-of-town people who were in attendance, there having

been special rates on the railroads because of the fact that the annual fall carnival was in progress in St. Louis at the same time. There were 248 pleasure cars, twenty trucks, nine delivery wagons and three fire-fighting wagons on view, the largest number of cars ever displayed here. In addition to making an unusually large number of agency appointments, the dealers report many sales during the progress of the show. Before the show closed, tentative plans were made to have the 1912 exhibit in the same place in the same way.

GARAGE SHOW AT OMAHA

Omaha, Neb., Oct. 9—The dealers in Omaha took advantage of the fall Ak-Sar-Ben carnival last week to have a garage show. At this season of the year the streets are brilliantly illuminated, and this year the rows of lights were carried up along the row. Most of the dealers had received 1912 cars, and had several of the demonstrators on the floors.

All of the sales rooms were decorated in the Ak-Sar-Ben colors, red, yellow and green. Special forms of displaying the cars were adopted, the Marion Automobile Co. having a car in the window, on a track, on which it revolved.

The rains throughout the week kept many away, but the row proved a rival to the street fair, in attracting attention, and many cars were sold, and new contracts made, during the week.

A. B. OF T. COMMITTEES NAMED

New York, Oct. 7—The new committees for the year were announced at the quarterly meeting of the members of the Automobile Board of Trade yesterday, and the work planned, together with the personnel of the committees, indicates important activities in motordom during the next 12 months. Work in the direction of the general advancement of the trade will be the main motive of the various committees. The new committees are as follows:

Patents—C. C. Hanch, W. H. VanDervoort, L. H. Kittredge, A. Macauley.
Trade—H. O. Smith, E. R. Benson, W. E. Metzger, C. W. Churchill, W. T. White.

Statistical—Benjamin Briscoe, E. P. Chalfant, J. S. Clarke.

Show—George Pope, Alfred Reeves, M. L. Downs.

Legislation and Law—G. H. Stilwell, William B. Hoyt, Albert L. Pope.

Intercourse and Arbitration—G. E. Daniels, W. C. Shepherd, J. W. Gilson.

Good Roads—R. D. Chapin, S. D. Waldon, J. N. Willys.

Publicity—Alfred Reeves, E. R. Estep, H. W. Ford.

Mechanical Coöperation—A. L. Riker, D. Ferguson, F. B. Stearns, C. W. Nash, H. E. Coffin.



CHICAGO FALL SHOW—NIGHT SCENE ON MICHIGAN AVENUE

Detroit Organizes an Export Bureau

DETROIT, MICH., Oct. 9—As a result of a movement now under way in the Detroit board of commerce shipments of Detroit made motor cars to South America and other foreign markets are likely to be very materially increased in the future. The first steps toward the organization of an export bureau as an adjunct of the board were taken last week, when President Milton A. McRae pointed out the possibilities that await local manufacturers in many of the foreign markets, especially in South America. F. E. Fisher, of the Studebaker Corporation, was appointed as the representative of the motor car manufacturers on a committee of five that will map out a plan of organization. The other members are: Mr. Copeland, of the Scripps Motor Co.; Charles Kingston, of the John Brennan Co.; Edgar P. Day, of the American Exporter, and Mr. Oldt, of the Burroughs Adding Machine Co. The functions of the bureau, as outlined in a general way, will be to place at the disposal of members a linguist to translate foreign letters into English and English letters into other languages; to give details of shipping, packing, invoicing and routing, the amount and method of collection of customs duties and such other information as would be of value in connection with foreign shipments.

Reo Makes Good Report

At the annual meeting of the Reo Motor Car Co., held in Lansing last week, it was decided to pass the semi-annual dividend and keep the money on hand, \$1,280,000, for a working surplus instead of borrowing money for the purchase of supplies and equipment, as has been the custom heretofore. The company is contemplating expenditures of about \$4,000,000 for this purpose the coming year. By next April, it is figured, it will be possible to distribute a 50 per cent deferred dividend, under this plan. R. E. Olds, the head of the concern, stated that the company has closed contracts for 10,270 cars and expects to get orders for 2,000 more in territory where contracts have not yet been closed. If only 10,000 cars were sold, the profit would amount to \$2,000,000, or 100 per cent on the capital stock, it is said. If 12,000 are sold, it will mean an additional \$400,000.

Mr. Olds expressed the opinion that motor cars would have to be sold on a closer margin this year and that, as bankers had shown a disposition to go slow with loans to motor car companies, he thought the Reo concern would best conserve its interests by retaining a good surplus, so that it would not be obliged to depend on the banks. In this connection he told of the difficulties he had experienced in trying to float a loan for the Reo company in New York. The company had to pay 6

Committee Appointed To Assist Michigan Car Factories in Getting Business in Foreign Countries—Reo Company Decides To Pass Semi-Annual Dividend and Keeps \$1,280,000 Surplus

per cent interest and Mr. Olds had to personally guarantee payment of it before the loan was made.

In addition to the extensive improvements that are being made at its Detroit plants, the Studebaker Corporation is planning to add 40,000 square feet of floor space to its Windsor plant. The Dominion stamping plant, which is a branch of a Detroit company, also will be greatly enlarged when the plans of the company are carried out.

Contracts have been let for a one-story sand blast building for the Briggs Mfg. Co., maker of accessories, as an addition to the company's big plant in Hamtramck. The Harger Steam Truck Co., of New York, has been organized by several prominent Detroiters, headed by John S. Harger, but no information is available at this time as to the company's plans.

Still Fighting Herreshoff

The North Woodward Park and Playground Association, having failed in the effort to purchase the property of the Herreshoff Motor Co., on Woodward avenue, on which the company is building a car factory, has filed a petition in the recorder's court asking that the property be condemned for park purposes. Summons have been served on the officers of the company and the owners of the land, from whom the company is buying on contract, directing them to show cause in not fewer than 20 nor more than 40 days why the petition should not be granted. This does not operate as an injunction, and the company is free to continue with its building operations unless some of the indignant citizens see fit to resort to injunction proceedings in addition to the efforts

toward condemnation. So far this step has not been taken by the objectors.

The Studebaker Corporation entertained dealers from Illinois, Indiana, Ohio, New York and Pennsylvania during the past week. In the Pennsylvania delegation were one or two dealers who had aided in the rescue work at Austin, donating machines. A. E. Backus, Studebaker agent at Smithport, Pa., was one of the first outside rescuers to arrive in the flood-stricken district.

Rotary valve construction was the subject of an interesting discussion at the meeting of the Detroit chapter of the Society of Automobile Engineers, Friday evening. About sixty of the Detroit members were present.

ANOTHER GAS TANK DECISION

Indianapolis, Ind., Oct. 9—Judge Albert B. Anderson, of the United States circuit court in Indianapolis, has entered a decree enjoining Orion K. Stuart, of that city, from obtaining empty Prest-O-Lite and Autogas tanks and refilling them for the purpose of putting them on the market. Judge Anderson also has referred the matter to Edward Daniels, master in chancery, who is to determine the amount of damages the Prest-O-Lite Co. has suffered by Stuart having filled such tanks. The suit was brought by the Commercial Acetylene Co. of New Jersey and the Prest-O-Lite Co. The tanks are sold only on condition they are to be refilled only by gas compressed by the Prest-O-Lite Co. The decree also finds that the Autogas company has manufactured tanks infringing on the patents of the plaintiffs and that Stuart refilled tanks manufactured by the Autogas company.



CHICAGO FALL SHOW—PARADE ON CHICAGO DAY

Early Fall Market Reports

Compiled by Motor Age Correspondents

Condition of Industry in Big Trade Centers

DETROIT, Mich., Oct. 9—In a general way the car selling situation in the Detroit territory may be summed up in the statement that there has been a better demand the past 5 weeks for all classes of cars than during the same period last year, the increase in sales ranging from less than 5 to, in one or two exceptional cases, several hundred per cent. For some of the Detroit factories the month of September was the largest producing month in their history, and it is a fact that practically all the cars that have been turned out have been contracted for.

Right here is seen one of the reasons why cars are selling better now than at the same time last year. Then the market was overstocked, and even though cars were offered on time, people held off from buying in the belief that the industry was in for a big slump and that there was going to be a wholesale slashing of prices. Manufacturers and dealers alike have profited by this lesson and the enforcement of a conservative policy all along the line has prevented a recurrence of these conditions. Other factors in the increase have been: A wider realization of the utility of the motor car, which a recent street car strike in this city helped to awaken; greater perfection in cars and in sales organizations, and better values at reduced prices in some instances.

The great demand in this territory is and has been during the period covered by this report for medium-priced cars, selling from \$1,000 to \$2,000, and the great majority of purchasers prefer their cars equipped. Dealers handling several models of the same car, ranging in price from \$1,150 to \$2,250, for instance, find that the \$1,250 and \$1,750 models are the best sellers. One dealer handling an electric line ranging from \$1,225 to \$3,800 finds that the popular model is the \$2,600 one. There is a constant and steady demand, now that winter is approaching, for coupes and limousines selling from \$2,250 to \$2,700.

Most of the dealers in high-priced cars report that sales for September were better than a year ago, with prospects good for the winter months. The people, however, are buying more closely than ever before. Where formerly they would order cars 3 and 4 months in advance of delivery they are ordering them only 30 or 60 days in advance. This condition is attributed to the uncertainty of the stock market, the disturbance incident to the defeat of reciprocity and the approaching presi-

dential campaign. The manufacturers of the high-priced cars are regulating their operations accordingly.

In a word, the situation with reference to the high-priced cars is simply this: While the sales in most instances show an increase over the same period last year, the rate of increase is not as high as it should be owing to the conditions noted. Of the cars selling from \$3,000 to \$5,000, the ones most in demand are those priced around \$3,500. In the cheaper lines the car selling around \$800 has the call.—Gordon A. Damon.

CHICAGO

Chicago, Oct. 9—Right now the retail business in Chicago is a trifle better than it was this same period last year, despite the fact that for the past month it has rained almost incessantly, which would tend to dampen the enthusiasm of those who usually buy in the fall because of the Indian summer. Taking this fact into consideration, the dealers feel that it is an indication there will be a lively business in 1912.

New models have reached Chicago much earlier than usual, taking them as a whole. Heretofore the majority of the dealers have found it almost impossible to get the new stuff here for September and October business, but this year the makers apparently are better organized and are following up their announcements by early delivery of demonstrators.

The demand for the cheap cars is, of course, as lively as ever and doubtless will continue so. The real feature of the fall business has been the interest the public is showing in the medium-priced class; that is, the cars selling around \$1,600, \$1,800 and \$2,000, and it is declared that this class is more than holding its own and, in fact, encroaching on the field of the higher priced models.

The second-hand car still is with us, and the dealers find themselves handicapped by being asked to take the old cars in trade, but it is a more conservative lot down the row than there was a year ago. So many have suffered by loading up with used cars that now when trades are mentioned the dealer is decidedly chary about the prices he offers. This trading-in problem is so aggravated that the Chicago Automobile Trade Association is considering a plan which it hopes will mitigate the nuisance. This has to do with a committee naming prices at which old cars may be taken in and asking each dealer that is a member of the association to put up a bond that

he will not exceed this price or cut the list on his own cars, with the idea of keeping the local business up and thus benefiting everyone.—C. G. Sinsabaugh.

MILWAUKEE, WIS.

Milwaukee, Wis., Oct. 9—Motor car selling in the Milwaukee and Wisconsin territory from the standpoint of the wholesaler or distributor, shows a marked improvement over the corresponding period of a year ago. All of the distributors have placed larger orders for the new season than they did for 1911 and agents and sub-agents have contracted for larger quantities.

The retail situation in Milwaukee and the immediate territory is as good as last year at this time. For 6 weeks the weather has been uniformly disagreeable and unfavorable and there has been no incentive for buying. All of which relates closely to the fact that Milwaukee has always been a spring buying center for the reason that cars are bought mainly as an investment. Milwaukee is essentially a German city and German means conservative. Why tie up one, two or three thousand dollars during the winter months without apparently unappreciable return on the investment? Thus, considering the unfavorable weather conditions, the situation actually is better than a year ago.

The medium-priced car, ranging from \$1,250 to \$1,500, continues to hold the lead as the best seller here. The experience of Milwaukee dealers has always been that the majority of first purchasers buy a low-priced car first and gradually go up the price ladder as they buy again.

The dealers who handle high-priced cars exclusively claim increasing business without reserve. The man who handles a low, medium and high-priced car says the demand for each is growing, the low and medium-priced cars leading the advance.

Competition has grown more strenuous than ever during the past 6 or 8 months in Milwaukee. The increase in the number of cars now represented in Milwaukee, either retail or both wholesale and retail, has been approximately 30 per cent in a short time.

Milwaukee banks have always been conservative in the matter of making loans to dealers, but not overly so. Those dealers who have dealt with Milwaukee banks for years, generally in other lines of business before taking up motor cars, have no difficulty whatever in getting anything they want from the banks—if the past has demonstrated their fitness to be granted credit. Newcomers have not been so fortunate, however.

In the case of new factory branches, however, there is not much credit-seeking, for obvious reasons. There has been a rather pronounced change in the texture of the wholesale field during the past few months because of the establishment of factory branches to take the place of individual distributors and agencies. Fac-

tories have waited until a dealer works up a corking good trade for their line and then jump in and carry away the fruits of the dealer's labor.—L. E. Meyer.

COLUMBUS, O.

Columbus, Ohio, Oct. 7—Dealers in Columbus and central Ohio are almost a complete unit in saying that better selling conditions prevail at this time than was the case at the corresponding time in 1910. This situation was not true up to September 1, when a marked change came over the market, and pessimism has given place to optimism.

There is a marked change in the demand in the rural sections, as there is a tendency to buy a higher priced car than was the case several seasons ago. But this is not quite general, for in some sections the cheapest sort of cars are still in the best demand. Where the purchaser buys his second car it usually is a higher priced car than his first purchase. The cars running from \$1,000 to \$1,800 will sell the best in this territory, although the demand will not be confined to cars between those limits. There will be a good demand for cars ranging from \$1,500 to \$3,000 and cars of a higher price will not be much in demand. One dealer sums it up as follows: The farming communities will purchase cars ranging from \$900 to \$1,800, with the best seller priced about \$1,200, while the city purchaser will buy cars ranging between \$1,250 and \$2,500. Of course there will also be a small demand for the \$4,000 and \$5,000 cars, but this will be at a minimum this season.

Farmers in central Ohio have been quite prosperous during the past season. Their wheat crop was excellent and the corn crop was slightly better than the average.

One dealer sums up the general business situation in Ohio as follows: "Ohio is neither an entirely manufacturing nor agricultural state and as a result a crop famine does not cripple the people as much as in some western states. Then again if there is a lull in manufacturing the agricultural elements will furnish a market for motor cars. Then in Ohio every one knows a little about mechanics and it is not as difficult to sell a car as in other sections, and after the car is sold it is not so difficult to keep it running. The roads are fairly good and the territory here has only been scratched. Ohio will be a good market for motor cars for years to come."

Banks are extending their usual lines of credit to dealers and little trouble has been experienced in getting advances. Banks have been lenient with the dealers in the past, and this policy probably will be followed in the future.—J. W. Lehman.

KANSAS CITY, MO.

Kansas City, Mo., Oct. 7—The market conditions in Kansas City during September and the first week in October are similar to the famous motor car famine in 1910. Dealers and branches are clamoring for cars. Thousands of orders are on their

Situation in Middle West

Cars Selling Better Than A Year Ago

Good Crops Reports Make the Outlook Bright

books, but with a few exceptions no cars are to be had.

To compare this September's business with last year's is not a fair comparison, as in this territory last year the dealers were trying to rid themselves of old models at any cost. The month of September and the first week in October has been very good with the dealers, but would have been 100 per cent better if cars could have been obtained.

Motor cars are selling much better in the territory adjacent to Kansas City because of the good crops and prosperous conditions. The demand for cars selling less than \$2,000 is very great and in Kansas, Missouri and Oklahoma it would be very difficult to find many cars that cost over \$2,000.

The banks are helping conditions wonderfully, as is illustrated by the following that was told to a large factory branch manager by one of his largest dealers in Kansas. "The banks are clamoring for the paper I take in exchange for cars," he said. "I have no trouble at all to procure money from banks." This bank condition prevails in this territory.

The Kansas City car business is rather quiet. All of the dealers selling big cars are showing a nice increase over last year.

The dealer in this city is being rapidly crowded out. Last September there were five factory branches; today there are thirteen. Few dealers have any territory and when the factories realize the importance of Kansas City as a distributing point these remaining dealers will have to go.—Paul Franks.

TOLEDO, O.

Toledo, O., Oct. 7—The month of September has been one of the most active in the motor trade of this section ever known in the history of the business, and there has been very little decline thus far in October. There has been an exceptionally nice run on moderate-priced cars ranging from \$900 to \$1,500. It is accepted as a settled fact that there will be no cut in prices of these cars on 1912 models, and there is no hesitation among buyers on that account. With cheaper cars the condition is different. Each concern is apparently whittling off all the edges in a final effort to undersell competitors, and in the meantime there has been hesitation among buyers who are cognizant of this fact, and are willing to await the outcome, and possibly save something in the end.

High-priced cars have been moving slow-

ly recently throughout northwestern Ohio. Electrics have been in splendid demand. A comparison shows a big increase in sales over the figures of last year. Local banks do not look with favor on the motor car business, and are willing to advance very little if any money to dealers for deposits on cars.—R. C. Spohn.

DAVENPORT, IA.

Davenport, Ia., Oct. 9—Continued and heavy rains throughout the greater part of September and the first week in October have seriously hindered the motor car business in the tri-cities and vicinity.

If the average demand in the tri-cities and vicinity has changed it is for a lower-priced car than last year; \$1,250 and under seems to be the most popular car, with indications for a lower price next spring.

The outlook for spring business is good, the dealers for the cheap and high priced cars both expecting a good trade. From present indications dealers will have no trouble in borrowing money from the banks for deposits on 1912 cars.—George M. Sheets.

INDIANAPOLIS, IND.

Indianapolis, Ind., Oct. 9—Prospects for the 1912 season appear to be very bright, and a trade in excess of that of the 1911 season is expected. Practically all of the local dealers are now delivering 1912 cars and manufacturers have been shipping out the new season's models for some little time. The outlook is said to be much better than it was at this time last year.

There is already some difficulty in delivering 1912 cars promptly, and a few of the agencies are behind on deliveries from 1 to 6 weeks. Dealers say they are asking for more liberal allotments than they had for the 1911 trade. A factory in northern Indiana states that it is now 205 cars behind on 1912 orders.

Locally, the banks feel very kindly toward dealers and are having no hesitancy in advancing money on contracts. It is stated that money is more plentiful than it was a year ago, and may be obtained on 90-day loans at from 6 to 8 per cent.

The bulk of the Indiana trade is for cars selling below \$1,000, but this does not mean there has been any decrease in the demand for higher priced cars. Indianapolis caters practically to the whole state, and the rural communities and small towns use more low-priced cars than any other. Second in demand are cars selling at from \$1,000 to \$1,500, for which

Motor Age's Early Fall Market Report

there is an especially good trade in Indianapolis.

Records of the secretary of state show that in 3 months, out of 7,813 registrations, 1,043 were for one car selling below \$900. The second best record was for a car selling at about the same price, for which there were 700 registrations. There were, of course, several hundred other cars sold during the same period below the \$1,000 mark. Dealers in high-priced cars say the outlook for the 1912 season is quite satisfactory and that sales in this line will be greater than in 1911.

The second-hand car situation is much more satisfactory than it was a few months ago. Dealers say they have a small number of second-hand cars on hand and they are not encouraging owners to trade them in.—C. L. Cummins.

FINDLAY, O.

Findlay, Ohio, Oct. 9—Never in all the history of the motor car has the chances for making a record-breaking year in the selling of cars been more favorable than now. This is the consensus of opinion of the five dealers in this city. The one bad feature is the fact that deliveries are slow. Dealers report that there never is any question about money while banks have not curtailed loaning money in any way for the purchase of motor cars and demand good security when they know the money is intended for such. The most popular priced car selling in this territory is the ones ranging in price from \$850 to \$1,250.—C. A. Wormley.

CINCINNATI, O.

Cincinnati, O., Oct. 7—The motor car business of Cincinnati and the district covered by Cincinnati agents and branches as well as manufacturers, which embraces southern Ohio, Kentucky and a large part of Indiana, is in a thriving condition according to reports received from many representatives in the industry here. The month of September and the first week in October have given great promise for the season of 1912, despite the fact that it is a presidential year. While dealers in the high-priced cars declare that their business is on the increase and that the demand appears to be increasing for the larger and more expensive car, yet it is safe to say, after receiving reports from many that the season of 1912 will see a great increase in the small or low-price car, ranging in price from \$1,000 to \$1,250.

This is due largely to the fact that scores of farmers are able to purchase the low-priced cars who are not able to buy the \$5,000 and \$6,000 or even the medium-price cars. However, the bookings for 1912 indicate that many business men have decided to discard their smaller cars and purchase the large ones.

The business for the year 1912 will far outstrip that for 1911, according to orders

In the Middle West Medium-Priced Cars Apparently Have the Call — Bankers' Attitude

being received now. The good condition of Ohio's roads and the streets of Cincinnati is a factor in the increase in the local market.

There is little hesitancy on the part of the local banks towards advancing money to the dealers for deposits on 1912 cars, provided his paper is apparently good; that is, if his orders are from men whose rating in the business directory show his financial standing is such that he is considered a good business risk. Many of the local dealers are so strong financially that they declare they are not bothered about such matters except in rare cases, when their output is unusually heavy in a very short time.—George L. Hussey.

OMAHA, NEB.

Omaha, Neb., Oct. 9—More cars have been sold during the month of September and the first week of October, 1911, than 1910, in Omaha and surrounding territory. The increase in sales is especially true of the lower priced cars. The car which has had the largest sale in Nebraska for the past year sells for less than \$1,000. The business of this company was over 400 per cent greater in September, 1911, than September, 1910. The other cars in Nebraska which are up at the top in point of number of sales run in price from less than \$1,000 up to the neighborhood of \$1,500.

As has been the case previously in Nebraska, the lower priced cars sell in much larger numbers, but the dealers in the higher priced cars report a good increase over last year. Practically all the dealers report better sales than a year ago. Some of them have been handicapped this fall by inability to get the 1912 cars rapidly enough. Some of the dealers in higher priced cars report better sales in western Iowa than in Nebraska, exclusive of Omaha. Better crops in Nebraska than were predicted a few months ago have undoubtedly aided in the good fall trade.

The tendency to change from dealer to branch is not quite so noticeable this fall as last year, and yet several new branches have been located here this fall, including one branch now seeking headquarters here. The increase in the sale of cars by some of the branches here was especially strong.

The banks are more liberal to the dealers about advancing money to them for deposits on 1912 cars than they were last year. For a time last fall they practically shut down on advancing money, but following considerable agitation, the bankers' association went back on previous action. In quite a few towns the bankers are personally interested in the motor car

business. The dealers in the cars that sell in the largest numbers find it easier to get the money. Some of them have found the money market a little tight.—L. A. Higgins.

GRAND RAPIDS, MICH.

Grand Rapids, Mich., Oct. 7—Visits to a majority of the dealers of this city show that selling conditions in this city and surrounding territory are excellent, the volume of business done in September being greater than that of August and still greater than that of September, 1910. Crops as a rule have been good in this region and in the city business is experiencing a reaction after the prolonged and disastrous strike of furniture workers which hampered trade greatly during its progress.

The 1912 models are finding a ready market, one dealer, for instance, making the statement that already this year he has orders for more 1912 models than the total amount of his sales last year. The demand is for the car which retails from \$1,000 to \$1,500, the medium-priced car, although the business in low and high-priced cars continues good.

According to a number of dealers the local banks will do absolutely nothing toward advancing money to the dealer for deposits on 1912 cars.—C. F. Dowling.

MINNEAPOLIS, MINN.

Minneapolis, Minn., Oct. 7—Medium-priced cars—for example, cars ranging in price from \$1,000 to \$1,200—still continue to be the best sellers on the local market of Minneapolis and surrounding territory. Several dealers report good sales of the higher priced machines, but the majority have found the less expensive cars to be in greater demand. Despite the fact that local conditions so far this year have been more favorable to the trade than last, dealers claim that cars are not selling any better than a year ago. This is accounted for by the fact that the tendency has been to buy lower priced cars in greater numbers and fewer of the higher priced cars, thus making the total revenue this year less than that of last. So in point of numbers this year takes the lead.

The fact that crops throughout the state have been good this year has kept the business up to the average, and the steady tone of business in general has been an important factor in the sales of cars.

The bulk of the business here is handled by dealers, branches having proven unprofitable by manufacturers. The tendency in this respect seems to be all in favor of the dealer, and in view of the failure of several branches to pay expenses, it looks as if the dealer will continue to remain the popular medium for the purchase of cars.

Motor paper is not wanted by local banks. Dealers find it almost impossible to secure

Present and Future Please Far West

advance money for deposit on 1912 machines, and when such advances are made bank officials take into consideration not so much the standing of the dealer as the car he intends to handle.—L. J. Boughner.

LIMA, O.

Lima, Ohio, Oct. 9—Lima dealers without a single exception predict that 1912 will be the banner year. They ascribe the condition in a general way because of the reduction in price in several well-known makes. Regardless this, many high-priced cars will be sold. A large part of the output now is being sold to farmers and they have the ready cash to pay for their machines. In other cases banks have been ready to advance money on good security.—C. A. Wormley.

ST. LOUIS, MO.

St. Louis, Mo., Oct. 7—St. Louis dealers report a generally increased demand for cars this year over last. The middle and higher priced cars have always been good sellers in this territory, although there also is an excellent demand for cars of low price. There has been a tendency of late to install factory branches here, several having been placed in the last year. The banks are liberal in advancing money for deposits on new stocks, as a rule, in some cases it being reported that bills of lading were not required, owing to the fact that many of the men connected with the industry have previously established excellent lines of credit in other lines of business. There was a general effort here to secure the new cars early, in order that they might be displayed at the show just closed, which gave an additional impetus to local trade. This extended to the surrounding territory, as well as to the city.—John Craig.

WASHINGTON, D. C.

Washington, D. C., Oct. 7—Sales of cars in Washington and the surrounding territory during September and the first week in October are about 10 per cent greater this year than last. This statement is based on interviews with the leading dealers and they are of the opinion the year's business will be about 30 per cent heavier in volume than it was in 1910. Cars listing between \$1,000 and \$1,250 are having the call in this section. Washington is essentially a medium-priced car town, although each year sees an increased demand for the higher priced machines. Peculiar conditions prevail here. For one thing there are no big manufacturing plants. Government clerks constitute a big portion of the population and the majority of them are not financially able to own a motor car. Real estate operators are among the big buyers of cars, and the other classes from which sales can be made are the merchants and wealthy people who spend the social season in Washington.—H. G. Ward.

Conservatism Is Noted in Denver—Optimistic in Tacoma—The Outlook in San Francisco

DENVER, Colo., Oct. 4—Reports from Denver dealers show that they are almost unanimous in declaring that the season of 1911 thus far shows a marked increase in business over 1910. Despite the encouraging reports concerning the opening of the season there is a marked tone of conservatism in most of the dealers' statements, and as a class they are not painting the future in the brightest colors. In the words of one of the most prominent of the Denver agents, "it will be a good year but not a big year." With all his conservatism, however, he is planning the greatest extension in his plant that will be made here this fall.

As is usual in city trade there are a good number of orders placed for the high-priced cars, and indications are that agents for this grade will maintain a satisfactory trade. Regarding other grades the prevailing opinion is that the bulk of orders will be placed for cars under \$2,000, and the dealers for these makes are conspicuous as the ones who are the most optimistic in their predictions and whose orders are running far beyond their shipments.

In certain parts of the state rural trade promises well, and the car under \$1,500 seems to predominate. Agents for the \$600-\$1,000 machines report a particularly heavy outside trade. Crops in eastern and parts of northern Colorado are partial failures and indications are that there will be a falling off in the orders in these districts. On the other hand, conditions in southern Colorado and New Mexico are encouraging.

The banks maintain their attitude of distrust toward the motor car business, and have restricted their loans to the minimum. The dealers, of course, regard this position as ill-taken and persist in their opinion that the Colorado situation is sound, even if there is not a boom year ahead.—F. D. Cogswell.

TACOMA, WASH.

Tacoma, Wash., Oct. 3—Tacoma's dealers are very optimistic with regard to prospects for an exceptionally good season. Cars are selling considerably better in this territory at present than they were at the same time in 1910. More inquiries are also being made than ever before and a goodly number of prospects are being closed.

One reason for this change in buying conditions seems to be the fact that the real estate business has not been as good this year, and one reason for this is the fact that a great many are putting their ready cash into motor cars. Taxes are

very high and a good many on this account are buying cars. Another reason, and probably the most important, is the large yields of wheat, fruit and hops this year. Prompt cash returns have been made the growers on their products and a great deal of this money has been invested in cars.

For the most part buyers have invested in cars priced at between \$900 and \$1,300, but there also have been several of the higher priced cars sold. One dealer stated that had the lumber market been better he had prospects who would have purchased a half dozen cars of high price, but as the lumber market did not improve the prospects hedged.

It is stated on good authority that Tacoma's banks never had more money, but only in a few cases have buyers of automobiles or the dealers asked the banks for money. In the Grays Harbor country, however, it is reported that the bankers were indisposed to lend money to car dealers.—F. K. Haskell.

SAN FRANCISCO, CAL.

San Francisco, Cal., Oct. 5—It is almost the unanimous opinion of the dealers of San Francisco that the September of the present year was a better selling month than the same period of last year. This same statement applies also to the entire year. It may be said without fear of contradiction that in nine cases out of ten among the old and well established firms the percentage of sales has been far higher than was the case last year. It is a fact that at the present time there are many dealers of the city who are not able to secure cars fast enough to meet the demand.

The month of September has not been as active, however, as the months from May to August, for it is rather in between seasons, which causes some of the dealers to complain that their business is not good—by comparison. It is merely the natural slacking off between seasons.

One of the things that is helping to increase this year's average over that of 1911 is the increasing demand for trucks. San Francisco and even the country outside is beginning to waken to the success of these elsewhere, and they are now being bought here in goodly quantities. One of the factors in the increasing trade is a general improvement in local conditions that is just becoming noticeable. This city has been quiet for a long time, but signs of a strong revival are evident. The securing of the Panama-Pacific international exposition served as a starter, and this was given another strong boost by the defeat of the Union Labor party at the polls on September 26 and the election of a non-partisan mayor, who it is expected will give the city a strong and clean administration for the next 4 years.

—W. H. B. Fowler.

Motor Age's Early Fall Market Report

ATLANTA, Ga., Oct. 6—Conditions seldom, if ever, have been on a more satisfactory basis than they are at present in Atlanta and the very considerable territory served from this city. There are a good many reasons, chief of which is general prosperity. In this section of the south crops are good. Savannah is breaking world's records for cotton shipments this season and the crop through the southeast is unquestionably excellent. More than that, the planters feel that because the boll weevil is bound to get them in a couple of years that they will raise all the cotton they can now. Occasional reports of strident times are heard, but there is nothing to bear out these rumors in actual conditions.

The car at a price from \$800 to \$1,250 is still in the best demand. There is not a great call for the very cheapest car nor is there a strong demand for high priced cars. However, the dealers in the high priced machines are not complaining.

Atlanta is feeling most strongly the change from dealers to branches. Most of the motor people say that branches lose money, but they go right ahead putting them in. One new one will open here shortly and another concern is looking for an opening. That will mean thirteen branches in Atlanta.

The banks do not seem to feel any great reluctance in advancing money to the dealers. The fact is that in the small towns the bankers are beginning to get into the business themselves. Local branch managers report a surprising increase in the number of bankers who are backing or actually helping to run agencies.—Percy H. Whiting.

LOUISVILLE, KY.

Louisville, Ky., Oct. 7—That improved highways and the promise of still better roads is chiefly responsible for the increase in the sales of motor cars in this state and southern territory during the past 5 weeks is the opinion of the leading distributors of this city. Local business—that is, the retail sales made here in Louisville—is a shade better than it was this time last year, but several of the principal agents say they have been unable to secure new models from their factories. Had they been able to obtain cars, these dealers assert their sales would have shown a decided increase. All agree that present selling conditions are good and indications point to a steady demand for machines during the winter months. As compared with a year ago there is a better demand in Louisville for the cars selling from \$1,500 to \$3,000. The demand for the cars selling above the latter price, however, is limited.

A conservative estimate, based upon interviews with a majority of the dealers, would be an increase of about 25 per cent in the sales during the past 5 weeks over

Extraordinarily Large Cotton Crop Makes Southerners Feel Confident of a Good Year—Louisville Reports Farmers Buying Motor Cars Liberally—Texas Finds Money Not So Tight

the same period in 1910. A few dealers and factory representatives say business is 50 per cent better, while several declare they have sold twice as many cars, but this is the exception rather than the rule.

In the south the farmers and the planters are buying cars very strong this year. It is outside of the cities where local distributors are doing the bulk of their business. The farmers—the majority of them—want a car selling in the neighborhood of \$1,000, and they prefer a touring car, though there is a considerable demand for the runabout. The car listed for \$800 and under finds a ready market south of the Ohio river, provided it has a reliable and well-known company behind it.

Good tobacco and cotton crops means prosperity in Dixie, and also the sale of more motor cars than ever before. Indications point to big yields.

The electric business is quiet now, but more of these vehicles are sold during the winter months than any other season of the year.

There is one feature that stands out more prominently than any other in connection with the industry in Louisville—that is, the rapid strides which the commercial vehicles have made in popularity and usefulness. The demand at present seems to be for a light delivery car. However, there is a good market for trucks.

Old established dealers have no trouble in securing money for deposits on 1912 cars, but the financial standing of all new agents is carefully investigated by the banks before funds are advanced. The second-hand car problem is still a vexing problem, for most of the owners who are anxious for a new model want to trade in their old car as part payment for a new one.—C. C. Swearingen.

AUSTIN, TEXAS

Austin, Texas, Oct. 7—According to the reports of local dealers, not only in Austin but in other towns of central and south Texas, the situation is very satisfactory. Sales kept up remarkably well all summer, even in the face of the prospects of a short cotton crop, which condition failed to materialize, it now being known that the production of the staple will probably exceed that of any previous year, taking the state as a whole.

September was a good month with Austin dealers and the first week in October showed a slight increase of sales over the corresponding week of the previous month. The sales for the present year in Austin and Travis county will be a little more than 100 cars, a slight increase over last year. At this time there are more than

600 cars in the city and county. With the placing in circulation of the money from the cotton crop it is expected the demand for cars will greatly increase. This increase in the demand may not become very noticeable until late in the year or early in 1912.

The principal demand is for cars ranging in price from \$1,000 to \$1,500. More \$1,000 cars are sold than of any other price. The demand for \$2,000 cars is also exceptionally good and seems to be increasing. The demand from the farmers is mostly for the \$1,500 car, it is stated by local dealers.

Complaint is made by dealers of the practice on the part of some factories of putting in curbstone dealers who are often irresponsible and cause no little annoyance to the legitimate dealer.

Local banks have not curtailed their practice of advancing money to the dealer for deposits on 1912 cars. Last year the banks of Texas generally made it a hard and fast rule not to make advances of this kind except to legitimate and responsible dealers. This had the effect of weeding out many of the irresponsible dealers and the business is now on a solid basis. Dealers of good financial standing find no difficulty in obtaining advances from the banks.—W. D. Hornaday.

RICHMOND, VA.

Richmond, Va., Oct. 7—The motor car business in Richmond and the territory adjacent to this city has been very satisfactory to the dealers in all makes of machines, many of the dealers reporting September and the first week of this month far in excess in number of sales over the corresponding month and week of last year.

It was the consensus of the dealers interviewed that the medium-priced machines, those selling at from \$1,800 and upward, were meeting with the heaviest demand. Two dealers reported cars ranging in price from \$1,000 up as in fair demand.

"Are the banks of Richmond liberal with the dealers in making extensions on 1912 cars?" was the question asked several of the foremost Richmond dealers. The answers were practically the same—that any agent having an established business and with a fair number of orders for 1912 cars could secure liberal loans from the various banking institutions of the city. "However," said one dealer, "I do not know whether the individual can secure loans on a car or not, as I have never had to resort to that."

The opinions of the dealers summarized

Status of Trade in South and Canada

In Dominion There Is Every Evidence That Motoring Has Advanced in Last 2 Years—Montreal Says Bankers Are Close While Winnipeg Declares Money Is Far from Being Tight

is that demand for cars ranging from \$1,000 upward is good; the repair men are kept constantly employed, the tire and specialty dealers have no cause for complaint, and every branch of the motor car business throughout the Richmond territory is at a stage satisfactory in every way to the ones interested in a monetary way.

The many miles of new roads being constructed throughout the state, and the improvements being made and contemplated in the highways of the commonwealth will add greatly to the demand for cars, since the price of many cars have become very reasonable.—T. D. N. B.

SAVANNAH, GA.

Savannah, Ga., Oct. 7—This section looks for a good season in 1912 because of the crop conditions. Just as an indication of this, eleven steamships sailed from this port a week ago today with 95,756 bales of cotton, valued at \$5,000,000, the largest cargo ever shipped from any port in the world in 1 day. Then, too, Memphis intends shipping something like 90,000 bales of cotton through this port. This, of course, means plenty of money in Georgia this winter and next spring, and consequently the motor trade is preparing to profit accordingly.

Bankers are not haggling any when it comes to loaning money to the motor trade, but like good business men they insist that good security be advanced when loans are made.—O. A. Meyer.

OKLAHOMA CITY, OKLA.

Oklahoma City, Okla., Oct. 7—Three leading dealers of this city are emphatic in their statements that the situation from the selling standpoint for the fall business in Oklahoma City and in the state is superior to that of 1910. Other dealers expressed the idea that motor cars were no longer looked upon as luxuries, but were to be classed as economic utilities, with the increase of business coming from the small towns and from the country in greater proportion than from the large and the medium-sized towns.

Fall business will be double that of last year was the opinion of one dealer, his customers being favorable to the two-passenger and five-passenger cars of medium prices. He believes that a reduction of the trade territory and a concentration of the selling efforts is the cause for a stimulation of sales and inquiries. Road building also helps to a marked degree.

The use of motor trucks in the small towns shows a decided gain. They are used by wholesale dealers, ice factories

MONTREAL, Oct. 5—It is only within the last couple of years that motoring has made headway to any perceptible extent in Montreal, and today there are quite a number of firms representing the leading cars of the day. It is estimated that there are now, including taxicabs and commercial cars, from 1,200 to 1,400 in use in the city of Montreal and vicinity, this being a considerable increase over last year.

The well-to-do farmers in the province of Quebec have taken to the motor car, and every season sees a gain in the number of cars sold in this regard. This year a heavy demand has been noticeable for the cheaper grade of cars ranging in price from \$1,000 to \$1,200, with a very fair call for the higher priced cars right up to the big six-cylinder models. In round figures it is safe to assert that one-third more cars have been sold to date than the corresponding date of last year. The selling season prac-

and a few baggage and transfer companies. The use of such trucks is following the installation of paving in all towns of Oklahoma which range in population from 2,500 up. Towns smaller than that have not, as a rule, paved any streets. The motor follows the paving in Oklahoma, especially for trucks, although the effect of the hard roads improvement is seen in the pleasure car as well as the car for business.

Merchants in the smaller towns are buying medium-priced cars. Professional men in the small towns as well as bankers have become interested to a surprising extent. During the state fair in this city this week, twenty-one citizens of Kingfisher, a town of 2,500 about 80 miles northwest from here, came to the fair in motor cars.

Bankers are not extending credit to dealers to make deposits on 1912 cars, but will advance funds to take cars from depot to put in storage until sold.

The marketing of cotton and other products, including livestock, just starting, will be responsible for the sale of many cars to farmers. This has been a dry year in Oklahoma, and while the first or spring crops were lost, this state can and does recuperate by the planting of second crops, and such second crops are beginning to reach markets. Indirectly, all interests will be benefited, for Oklahoma is an agricultural state, although the eastern part produces much oil, gas and coal.

The gain in the sales of motors is from the country towns and the farmers. The increased business in the twelve principal

cities of Oklahoma gives no sign of a gain this fall.—S. T. Bisbee.

tically finishes the end of October, as orders placed after that date are intended for next year's delivery, as the heavy snow during the winter months is detrimental to the sale of motor cars, although each winter sees more cars in use. The winter months also has its advantages to the garage man, as it is productive of ready cash for storing of cars until the opening of spring.

As far as can be learned, the establishing of branches does not seem to be general as yet, there apparently not being enough volume of business in any one car to support a branch. Although there are a few in Montreal doing a steady trade.

It is hard to discover a case where any of the local banking institutions will advance money to a dealer for deposit on 1912 models as they look upon and consider the motor car business a very precarious one. Coming down to brass tacks, it would be considered a hard task to point to any one firm in Montreal that really seems to have made money in the business, as they have to crowd all their sales into a few months in the year and do enough business to carry them over the winter.—A. L. McDougall.

WINNIPEG, CANADA

Winnipeg, Canada, Oct. 6—Demand for cars in western Canada will depend largely on the ultimate outcome of the crop situation which has been held back by the bad weather prevalent during the past month. Should weather improve even at this late date the demand for cars in 1912 will be larger than in any previous year. The medium-priced car will be biggest seller, although there will be good business done in high price cars in Winnipeg and the larger towns and cities of the west. The farmer, however, is looked upon as the man most likely to affect the demand for cars during 1912. Local dealers are preparing to carry far heavier stocks than during 1911 and are making arrangements with factories to take care of them as much as possible. Money for legitimate business is easily procurable for deposit and for enlargement of business by responsible dealers.—A. C. Emmett.

WILMINGTON, DEL.

Wilmington, Del., Oct. 9—A brighter or more hopeful set of business men than the dealers of Wilmington would be hard to find, for the reason that as a rule they report business better than it was a year ago and improving. The chief reason given for the improvement in the business over last year was the fact that the roads in the state, especially in the upper part, are being gradually and rapidly improved. Low-priced cars, ranging from \$900 to \$1,600, most of the dealers say, are the best sellers.—A. O. H. Grier.

Motor Age's Early Fall Market Report

Normal Conditions Prevail in Boston, Condition of Stock Market and Late Deliveries Being Explanation for Lack of Boom—Second-Hand Cars Continue To Be a Big Handicap

BOSTON, MASS., Oct. 10—Market conditions in Greater Boston at the present time are what might be called normal. There is not the enthusiasm noticeable these days that has been apparent about the same time in past years, but it is not hard to analyze conditions. This does not mean that the dealers are pessimistic, the few who are so having reason to be. After talking with many Boston dealers the Motor Age representative formed his conclusions from facts and figures which some of them gave him in confidence.

The good and bad features of the trade form a sort of check and balance system not unlike a government plan. For instance, so many second-hand cars were dumped on the market the past year that they are really a drug at present, no matter what anyone may say. Another reason for business not being exceptionally greater is the lateness of deliveries. Of course the condition of the stock market the past year has been a factor in preventing extraordinary sales such as has characterized some of the past years when orders came with a rush. But there has been enough of new orders to carry business along similar to a year ago.

Those are some of the things that have prevented the big increase. On the other hand, there have been a number of things that have helped the dealers to book orders enough to bring the conditions to normal in the face of what otherwise might be termed a bad financial year. The fact that the cars come fully equipped now so that the motorist is not kept waiting a week for the accessories to be fitted on has helped somewhat. Then the cars that have the newer devices such as self-starters and electric lighting have found purchasers because the present day motorists keep posted on what is new and they are looking for all they can get for their money.

The makes that have added sixes to their line have found a number of their regular customers ordering new cars, and some of them could sell to men who have driven other makes if they could get a reasonably early delivery. There is no question but what the cars that have been on the market several years and have become thoroughly well known are doing a good business. This applies to cars of all prices. The machines selling under \$1,000 naturally lead in numbers, yet when the total figures are averaged up they do not exceed those of higher priced machines. The cars under \$2,000 and those from \$4,000 up are more in demand apparently just now. There are exceptions to this, of course, comprising a few of the cars in the

\$3,000 and under class that have always sold exceptionally well in Boston by reason of their being long established and having earned a splendid reputation. This is due to the fact that no one particular class of cars has ever had the call in New England, the motorists here having had a mechanical knowledge based on the years of manufacturing that brought prosperity to the section.

The dealers who have been in business for any length of time have no difficulty in getting money if they can put up fairly good security. Money has been easy and, in fact, so much so that with good indorsements it is possible to get plenty at about 4½ per cent. So the agents are not having much difficulty in getting enough to carry them along, although there are some who will go under before the next show arrives.

The more the situation is studied the more impressed one becomes by the fact that the industry has reached a settled stage now, and the men engaged in it realize more fully that it is a legitimate business in which business methods are imperative. The men who have made big successes in Boston are those who put their agencies or branches on a real business basis long ago and relegated to oblivion the tendency to joy-riding and carousing.—J. T. Sullivan.

BRIDGEPORT, CONN.

Bridgeport, Conn., Oct. 8—Dealers of western Connecticut report an unusually large sale of cars during the month of September—in fact, nearly 18 per cent greater than a year ago. This fall there has been a great demand for five-passenger machines costing between \$1,100 and \$1,500 and runabouts costing about \$1,000.

The present condition of the roads throughout the state is believed to cause the demand for these cars. There has been no pronounced change in this territory from the dealer to the branch. Some of the dealers have endeavored to cover their large territory personally rather than leave it to inexperienced salesmen who accepted the agency in order to gain a small reduction when purchasing a car.

The banks of western Connecticut today stand ready to advance money to responsible dealers on account of past experiences. It is the general belief of the bank officials that if they advance the necessary amounts from time to time it increases their business with the dealer as well as increase the business of the dealer and the people. Several small dealers have dropped from the ranks during the summer.

Business as a whole during the month of September and the first week in October

has been very gratifying to the dealers. At the present time it is not believed that there will be a show in Bridgeport this winter, as the lesson learned by the dealers 2 years ago was sufficient to convince that it did not bring returns.—C. P. Beers.

WORCESTER, MASS.

Worcester, Mass., Oct. 7—Over two-thirds of the thirty-five local dealers, most of whom have the whole of Worcester county as their territory, report business for September and the first week of the present month nearly double that of the same period last year.

Conditions in Worcester for an increase sale are at this time better than ever before. At the present time there are some forty-eight makes represented in Worcester as compared with thirty-nine the same period of last year, while as for the agents and dealers they have increased to almost double. In only a few cases are the Worcester dealers compelled to call upon the local banks for money to advance on new cars, while the attitude of the banks towards advancing money for deposits on 1912 cars is not altogether favorable.

The demand for moderate price cars ranging in price from \$1,000 to \$1,800 is fast overstepping the sale of cheaper grade and in another year the medium-price motor-driven pleasure vehicle will predominate in Worcester and Worcester county, there being but few who believe in paying over the mentioned amount for a higher grade car.—J. B. Wheeler.

HARTFORD, CONN.

Hartford, Conn., Oct. 9—Dealers are most optimistic over the prospects for the coming season, the sales for September and the first week of October indicating a much greater business than in any previous year. A canvass of several dealers whose cars sell under \$2,000 reveals the fact that cars selling for \$1,000 and under are finding a much greater sale this year, especially among the farmers, who are buying cars now as they never have before.

Being a city of large financial institutions and wealthy people, Hartford naturally furnishes a large field for the more expensive cars and there are several dealers specializing on higher priced cars and their sales are comparatively large. Cars selling from \$3,000 to \$5,000 find ready purchasers in this city, though the number is, of course, small in comparison with those who buy the car for \$1,000 or less.

Local banks do not hesitate to advance money to local dealers. Three or four local banks carry a majority of the dealers and those who require money are readily accommodated. Some of the banks buy paper from dealers, but most of the dealers do business on a strictly cash basis so that they do not have much paper to sell the banks.—R. W. Olmsted.

Outlook in New England and the East

PHILADELPHIA, PA., Oct. 6.—The trade situation in Philadelphia is a puzzling one when it comes to sorting the facts in the case, opinions of dealers showing a wide variance, and it is difficult to estimate a point between the extremes and say that it more nearly than any other is indicative of the whole. Some dealers report trade indifferent and a noticeable falling off in the demand during the past 5 weeks, amounting in a few cases to as high as 25 per cent, with fewer cars being shipped. But these are in the minority, a vast number showing an increase in the same time over any corresponding period in this or last year, with a corresponding increase in the average price of cars sold, so that the consensus of opinion would indicate a healthier condition and at the same time a settling to a more stable basis.

To say that the average price of the best selling car is less than \$3,000 is not very definite nor very illuminating, but this proposition hinges upon several points and it would be easier to designate three common prices that sales hinge on. Eliminate the medium and higher-priced cars for a moment and take the cars selling below, say, \$1,500, and demand is excellent; between \$1,500 and \$3,500 sales run the gamut of the extremes, from a falling off compared with the same period last year to an increase amounting to 75 per cent. It may be mentioned here, too, that dealers have a great many forces to contend with: Buyers want to set their own price; the demand is for a car fully equipped, and the second-hand car bugaboo will not down, not infrequently a fictitious value being placed on the used car. In the higher priced car the best seller averages \$5,000, sales at the latter figure showing an increase over last year, the six-cylinder car being preferred.

While no pronounced changes have been made lately from the dealer to the branch, the latter seems to hold the boards and the branch is preferred. The attitude of the banks towards dealers and manufacturers is invariably one of friendliness, and while of course the proper indorsement is always required, first-class relations exist.—G. Roy Mason.

PITTSBURGH, PA.

Pittsburgh, Pa., Oct. 9—The consensus of opinion among Pittsburgh dealers now seems to be that September business was draggy but that October is opening up fine. The chief reason for a dull September among buyers in high-priced cars is that very few of their customers got back to the city before the 20th. This staying-away-until-frost-time habit is growing on Pittsburgh people and owing to the fine weather this year more arrived home late than ordinarily.

Another point on which all dealers agree

Most of the Philadelphia Dealers Claim Increased Business Despite Handicaps That Exist—Pittsburgh Finds It Slow in September But Snappy in October—Conditions in Baltimore

is that the total of 1912 cars ordered is from 10 to 20 per cent less than that of 1911. Still another very important conclusion by them is that every shrewd and well-posted dealer in the city is making a special effort to get away from the trading business and partly on this account cut down his requisitions for 1912 stock.

Most concerns report the total of 1911 cars sold as good and in some cases better than 1910. Varied opinions are advanced as to the prospects of 1912 winning over last year's total. There is a pronounced stringency in money matters among professional and small business men, it is said, which is naturally working against the sales of motor cars, especially high-priced ones. On the other hand the general business and industrial outlook has improved wonderfully within the past few weeks so that if this gain continues in the Pittsburgh district it will so far overshadow any financial doubts now existing in the minds of prospective buyers as to make certain a very satisfactory total of 1912 sales this fall.

General reports indicate that Pittsburgh banks still have plenty of faith in the motor car business, for dealers report that they are getting accommodations easily. It is only apparently where individuals or firms are known to be financially unsound that Pittsburgh banks are turning down their applications.—H. A. Lane.

BALTIMORE, MD.

Baltimore, Md., Oct. 1—Statements from various dealers in this city are to the effect that the motor car business in Baltimore and the surrounding territory is in splendid shape at this time and there is no indication of a letup in the matter of sales. The month of September and the first week of the present month showed up nicely from a sales standpoint. In almost every case when they were asked regarding the September sales of this year in comparison with those of the same period of last year the answer was that there was a decided increase.

It is interesting to note some of the reasons advanced by local dealers for the general betterment of the industry. The trend of these statements is to the effect that the people down this way are just about beginning to realize the great value of the motor car for both business and pleasure purposes. This is shown, as many dealers explain, by the fact that there has been quite an increase in the number of business men who reside in the suburbs or outlying sections of the city who drive to and from their places of business in their

motor cars in preference to horse-drawn vehicles or the street cars. Thus, in addition to being time-savers on business and pleasure trips, Baltimoreans are beginning to realize that these motor vehicles are a means of furthering their education, and this is another strong point in their favor. In a word, the dealers claim the people in their territory have been shown the great value of motor cars from so many standpoints that they are waking up to the usefulness of the motor vehicle and making purchases.

Regarding the sales of big cars, one dealer made the statement that his branch sold five times as many cars up to September 30 of this year as against the same period of last year. On the other hand, a dealer of small cars said that the sales of his firm for Baltimore alone during the present were almost double those disposed of during the previous year in Baltimore and the states of Maryland and Virginia combined, this territory being under the jurisdiction of the local office.

There have been no changes of any consequence from the dealers to branch houses or vice versa. The dealers have predominated for years and continue to do so by a wide margin, and there are no indications of any immediate changes in this respect.

From statements of dealers it would seem that they have little trouble in obtaining from the banks deposits on 1912 cars in cases where such deposits are solicited. They say that the banks have been quite willing to make such advances when offered substantial collateral.—A. Robert French.

SYRACUSE, N. Y.

Syracuse, N. Y., Oct. 7—A careful poll of the agencies of this city, which community is the main distributing point for all central and northern New York, reveals these attested facts regarding the motor trade proposition in this section. The demand is growing more pronounced for the medium-priced pleasure cars, as against either the extremely low-priced or the highest priced vehicles. Among the commercial vehicles the demand is at present far more prevalent for the lighter trucks, though there is a constant growth in vogue, too, for the heavier machines.

There is a constant growth in interest in the country districts, and in both cities and the farming territory the sales of 1912 cars promise to be greater, throughout the entire section covered by Syracuse agents, than in any year preceding. At the same time, though the business bulks bigger than ever before, the banks not

only of this city but throughout central New York are extremely conservative in lending any money to dealers for deposits on 1912 cars. The reason, as stated frankly by men high in banking affairs of this city, as well as by some prominent dealers, is that many persons in the cities, who cannot properly afford to do so, maintain motor cars. The record for the month of September and the present week, on which the appended data is based, must not, however, be taken as indicating that there is a falling-off in the demand for high-priced, standard cars. Without an exception the reports from agencies handling such makes are of a definite increase in vogue; and the same is true of the leading makes of low-priced cars. But the consensus of reports show that the medium-priced car—the car selling, according to the manufacturers' range of prices, from \$1,200 to \$2,500—is distancing all others in bulk of recent sales and as a magnet for prospects.

All along the line 1912 prospects have a healthy tone. A prominent wholesaler in the cheaper grades of pleasure cars, whose territory includes eleven counties through central and northern New York, gives the following significant figures on his orders for the past month. Out of thirty-four orders for immediate delivery there are desired fifteen cars at \$1,000, fourteen at \$1,300 and five at \$600 each. a considerable part of this agency's trade is in the country districts, and the figures show how the trend is inclining toward higher priced cars than the farmer originally wanted.—O. L. Lyman.

NEW YORK

New York, Oct. 9—Business in the metropolitan district has been satisfactory from the viewpoint of the retail distributors. During the present season, in volume of money, it is practically equal to 1910, and represents close the same number of sales. Some of the higher priced lines have enjoyed an extra good season, one typical concern reporting 543 sales the year against 509 in 1910. In the \$3,000 class there has been a marked improvement, but in the \$2,000 class there is an apparent falling off. The low-cost cars have had a good year. Two of the companies handling cars of the highest prices have fallen a little short of last year's business, but not materially. At the outset of the season many of the selling companies failed to make preparation for so large a year as 1910, and the decrease as compared with business of that year is largely confined to the companies that failed to contract for enough cars. A few of the selling concerns can make immediate delivery of cars, but in the main the row is sold out. The companies that made contracts equal in size to those of 1910 had a prosperous year. The indications for 1912 are for material increases in the volume of sales with business pretty well distributed through the various classes.—David Beecroft.

Export Business Continues To Grow

Government Report for Month of August States Cars Valued at \$1,248,925 Were Shipped Abroad—American Parts Also in Great Demand in Foreign Countries—Imports Show Increase

WASHINGTON, D. C., Oct. 7—With every succeeding month the exports of motor cars and parts continue to grow at a rate that must be highly gratifying with the motor car makers. During August the high water mark of 1,150 cars, valued at \$1,248,926, together with parts, not including tires, valued at \$306,724, was reached. During this month last year the number of cars shipped abroad was 656, the value of which was \$897,322. The exports of parts were valued at \$136,437. The figures for the 8 months' period ending August are even more gratifying. The number of cars exported rose from 5,970, valued at \$8,266,808, in 1910, to 10,085, valued at \$10,443,490, in 1911, while the shipments of parts, not including tires, increased from \$1,408,495 to \$2,207,981.

The detailed shipments for August last and the 8 months ending August were as follows:

Exported to—	—August—		—8 Months—	
	No.	Value.	No.	Value.
United Kingdom	261	\$213,328	2,136	\$1,867,323
France	51	45,024	324	371,824
Germany	6	7,049	79	98,332
Italy	5	5,597	142	175,511
Other Europe	66	49,581	574	541,803
Canada	217	314,437	3,941	4,239,702
Mexico	15	18,669	162	276,733
W. Ind. & Bermuda	18	20,179	193	230,611
South America	92	122,080	536	726,309
British Oceania	323	295,548	1,261	1,153,744
Asia, oth. Oceania	77	138,867	554	566,986
Other countries	19	18,567	183	194,612

Imports of cars during August loomed up larger than for some time past. The number of cars imported increased from eighty-nine, valued at \$189,874, in August, 1910, to 116 machines, valued at \$245,878, in August, while during the 8 months' period the number decreased from 723, valued at \$1,443,871, in 1910, to 608, valued at \$1,312,969, in 1911. The imports of parts likewise increased from \$9,469, in August a year ago, to \$13,881, in August last, while during the 8 months' period they declined in value from \$557,605 to \$225,552.

Cars were imported from the following countries during August and the 8 months' period:

Imported from—	—August—		—8 Months—	
	No.	Value.	No.	Value.
United Kingdom	5	\$14,013	91	\$217,375
France	36	73,090	209	458,472
Germany	10	24,315	110	258,163
Italy	30	55,890	72	111,725
Other countries	8	22,566	126	287,234

DENVER TIE BROKEN

Denver, Colo., Oct. 9—The tie which ended the Chalmers owners' consistency tour last month was decided on Saturday when Allen De Berry Bowen and Dr. Edward Lazelle, the joint winners of the McDuffee trophy, made a run to Colorado Springs and return. As the result of an almost perfect score Mr. Bowen now holds the cup. The contestants were given a schedule, and a checking car accompanied

them to see that they maintained it or were penalized. Mr. Bowen returned to Denver only 19 seconds off his running time, while Dr. Lazelle experienced some tire trouble and was delayed an hour.

DETROIT HOLDS SOCIABILITY RUN

Detroit, Mich., Oct. 10—There were twenty-one entrants in the under sealed orders sociability run of the Wolverine Automobile Club, Sunday. It was a perfect day and many of the participants took their families along. The route had previously been laid out by a pathfinding car. The first section of the run was from Detroit to Plymouth, 30.8 miles, the second from Plymouth to Pontiac, 40.1 miles, and the final stretch from Pontiac to Detroit via Utica, 40.1 miles. The going was excellent with the exception of about 3 miles. C. C. Cross, of the Chalmers Motor Co., won the silver trophy offered by the Home Telephone Co., his time being just 30 minutes slower than that of the pathfinder, which was 6:45:00.

MILWAUKEE CLUB ELECTION

Milwaukee, Wis., Oct. 10—Lee A. Dearholt was elected president of the Milwaukee Automobile Club at the annual meeting of the board of directors on Monday evening. Arthur C. Brenckle, secretary for 4 years, was elevated to the first vice-presidency and Frederick Gettelman was re-elected second vice-president. Leonard E. Meyer was elected secretary. Clarke S. Drake, former president, was the choice for treasurer. At the annual meeting of the club, eight directors were elected to fill vacancies and expired terms, as follows: Lee A. Dearholt, Dr. Louis Fuldner, William H. Raymond, John W. Tufts, Frederick Gettelman, Orrin E. Grovier, Percy C. Avery and Leonard E. Meyer.

FLANDERS BEATS BIG CARS

Indianapolis, Ind., Oct. 11—About 4,000 persons attended the hill-climb held on Bright's hill, south of Bedford, yesterday. The hill is about $\frac{1}{2}$ mile long and an 8 per cent grade. There were no serious accidents. Spectators were present from a radius of 100 miles and the climb was arranged by motor car interests of Bedford. Prior to the climb there was a parade of about 100 cars from Bedford to the scene of the contest. Summary:

230 cubic inches and under—Clayton Pierce, Flanders 20, won; Frank B. Willis, Flanders 20, second; D. H. McCoy, Buick 10, third. Time, :53%.

231 to 350 cubic inches—Ida Matthews, Marion, won; John D. Glover, Westcott, second. Time, :47%.

Free-for-all—Clayton Pierce, Flanders 20, won; Ross McCoy, National 40, second; Frank Fox, Pope-Hartford, third. Time, :42.

New Grand Central Palace Is Opened

Electrical Show Now in Progress in Reconstructed Building in Which Motor Cars, Pleasure and Commercial, Are Being Displayed—Reports Indicate Shaft Drive Is Growing in Popularity

NEW YORK, Oct. 11—Special telegram—The New Grand Central palace opened its doors today to the electrical exhibition at which many electric, pleasure and commercial vehicles are being shown. The manufacturers are optimistic for the 1912 season. The question of batteries is not giving much trouble, as they have been perfected to give a wide area of operation without recharging. Pneumatic tires are being extensively used for the coming season, cushion tires have a good following also. Shaft drive is gaining, one exhibitor claiming that there were more electrics of that type sold today than with chain drive. Independent brakes operate on drums attached to the driving wheels, operated by a pedal independent of the motor brake which is operated by the control lever. Various types of control are shown and this part of the car's mechanism seems to have been simplified.

A note struck by one manufacturer seems to be a possible solution of one of the difficulties at present in the minds of prospective buyers of commercial vehicles. Salesmen in their endeavor to make sales are not confining themselves to facts and instead of coming out in the open and stating that the electric vehicle is primarily a town and short-delivery vehicle are endeavoring to overestimate its values. Most of the makers are turning out at least one and in some cases two new models for the coming season.

SOUTHERN ROAD ENTHUSIASTS MEET

Richmond, Va., Oct. 5—Six states—Georgia, South Carolina, North Carolina, West Virginia, Virginia and Tennessee—were represented at the third annual meeting of the Appalachian Good Roads Association held at Roanoke, Va., October 3-5. The association was formed in 1909.

The following officers were elected, after Spartanburg, S. C., had been selected as the next place of meeting, in October, 1912: President and treasurer, Dr. Joseph Hyde Pratt, of Chapel Hill, N. C., re-elected; secretary, H. B. Varner, of Lexington, N. C. Vice-presidents: Tennessee, Cyrus Kehr, Knoxville; Kentucky, Hon. Joseph F. Bosworth, Middlesboro; Virginia, J. Thompson Brown, Abingdon; Georgia, Professor Charles M. Strahn, Athens; West Virginia, C. E. Krebs, Charleston; South Carolina, F. H. Hyatt, Columbia; North Carolina, E. C. Chambers, Asheville.

G. Hampton Rich, of Winston-Salem, N. C., editor of the Carriers' Messenger, the southern organ of the rural mail car-

riers, introduced a resolution which had for its purpose the co-operation of the organization with the rural mail carriers in the improvement of the post roads and the securing of federal aid for such highways. The resolution was adopted.

Among other resolutions adopted were a reiteration of the principles upon which the Southern Appalachian Good Roads Association was formed; a strict adherence to the original plans of the organization, and for the renewal of enthusiastic effort for the successful prosecution of the purposes of the organization.

BRIGHT PROSPECTS FOR GLIDDEN

New York, Oct. 10—The Glidden tour which starts Saturday of this week will have seventy-two contesting cars and approximately ten additional official cars, giving a total of eighty-two for the run from this city to Jacksonville, Fla. The first day's run will be facilitated through Jersey because of the state authorities having granted permission for the tourists to go through without taking out state licenses. The contestants have been divided into teams wherever possible so that sixty of the seventy-two will contest in the form of twenty teams of three cars each. One Atlanta, Ga., team is made up of three Flanders cars; the Tarrytown team consists of three Maxwells; the Nashville team is three Marathons; the Atlanta Journal team consists of an American, a Thomas and a White. Three Metz cars make up the Waltham team; three Halladay cars comprise the Albany, Ga., team; a second Atlanta, Ga., team is made up of three Stevens-Duryeas; a Detroit team consists of three Flanders. There are other Atlanta, Ga., teams made up of different makes of cars.

CONNECTICUT MAKES MONEY

Hartford, Conn., Oct. 10—The extent to which the motor car helps the state in defraying the expenses of the good roads movement is evidenced by a report which the secretary of state has just issued. During the last 12 months the state has received \$230,120.89 from car owners. A big percentage of this sum naturally comes through registrations of privately owned cars and through the registrations of operators. The sum is a gain of \$65,000 over the 12 months previous, indicating the rapid advance of the motor car in the state. The figures of the report are interesting. They are:

Fines, \$2,655.78; registrations, \$182,890.61; operators' licenses, \$41,616.00; duplicates, \$198.50; transfers, \$2,216.00;

additional markers, \$544.00; total, \$230,120.89.

The Connecticut laws provide that the money derived from the motor car department shall be used in connection with the good roads work, and, although the state is annually spending hundreds of thousands of dollars, the revenue from the motor car will materially help in advancing the work.

TRACK MEET IN DAKOTA

Madison, S. D., Oct. 9—At the Lake county fair held here last week good races were run on the $\frac{1}{2}$ mile track which had been put in good condition and scraped and smoothed with a gasoline traction engine. In the free-for-all a Ford special, driven by J. C. Ralston, of Sioux City, won in 6:10 $\frac{1}{2}$ for 5 miles. C. D. Adams, of Sioux Falls, brought in a Falcar a close second. In the 5-mile race for 30-horsepower cars H. M. Hessenins, of Sioux Falls, was first with an E-M-F; William Jaeger, of Sioux Falls, E-M-F, second; G. J. Gilbert, of Brookings, Chalmers, third. Time, 6:53. William Jaeger won the potato race in a Flanders. Sam Barger, of Madison, with an E-M-F and H. M. Ricer, of Sioux Falls, with a Flanders, won the relay race. The last race was a free-for-all, the distance being 10 miles. The Ford special, driven by J. C. Ralstone, was first, with H. M. Hessenins a close second in an E-M-F.

HIGHWAY SCOUTS EN ROUTE

Richmond, Va., Oct. 7—The highway scouts promoting the connecting link in the national highway between Bristol, Tenn.-Va., and Washington, D. C., met with rousing receptions at every stopping point between Bristol and Washington, and the good that has been done in the interest of good roads and highway improvement is beyond estimate.

The scouting party left Bristol on the second day of October with five cars in line, carrying twenty people, including road experts, newspaper men and others. Stops were made at Abingdon, the county seat of Washington county, Virginia, where county officials in brief talks told of what they had done and were going to do in the matter of road improvement.

After attending the third annual meeting of the Appalachian Good Roads Association the scouts started on a tour of the Shenandoah valley, on their way to Washington.

ENGINEERS SAIL NOVEMBER 1

New York, Oct. 11—The committee on arrangements, immediately in charge of the trip during next month to Europe of a material percentage of the Society of Automobile Engineers, is constituted as follows: H. F. Donaldson, chairman; Howard E. Coffin, A. J. Slade. The party will sail from New York November 1 on the officially appointed steamer Mauretania.



OPENING OF ROAD TO GLACIER PARK



THE PINE FOREST NEAR COLUMBIA FALLS



AT DANGEROUS SPOTS STOUT RAILINGS ARE ERECTED

Routes and Touring Information



HE formal celebration of the completion of the Kalispell division of the park-to-park motor road was in the form of a run of fifty cars September 10 from Kalispell, Montana, to the foot of Lake McDonald in the Glacier national park. The run was planned by the Flathead Motor Club and the weather conditions were ideal. A light rain had cleared away the haze from the forest fires, and the mountains and hills stood out in sharp outline as far as the eye could see.

The line of cars formed at Kalispell, leaving here at 8:30 a. m. and arrived at Lake McDonald just at noon. The speed was reduced to 10 miles per hour through the dangerous places, such as Bad Rock canyon, and although some anxiety was felt on account of a few new drivers, every car got through safely. The route of the new highway was followed; the cars going north through Columbia Falls, crossing the Flathead river, and then through the Bad Rock canyon to Belton and Lake McDonald.

At Columbia Falls a number of cars from that place and Whitefish joined the run, which proceeded through the wildly beautiful Bad Rock canyon with its overhanging cliffs on one side and the blue Flathead on the other. Over the South Fork and into the heart of the forest reserve we followed a winding road of matchless beauty, curving through the dense pine forest. The trees stand thick and straight on either side 100 feet in height, forming a cool aisle through which the smooth, well-drained roadbed runs. On one straight gash through the forest



THROUGH BAD ROCK CANYON



ROLLING THE ROADBED AT THE FOOT OF LAKE McDONALD

Park-to-Park Highway Opened

with the trees shutting off the view on either side, straight ahead framed in forest is a wonderful view of Boxcar mountain.

Out of the forest and down a long decline to the shores of Lake Five, deep blue under the brilliant sunshine, runs the road on the last stretch to Belton, the gateway of the park. Here the Great Northern railway has spent many thousands of dollars in fitting up a hotel in the form of Swiss chalets for the accommodation of visitors.

The road from Belton to Lake McDonald, a few months ago an old tote road which followed a devious course around stumps and fallen trees and literally through swamps in the forest, is a broad macadamized highway built by the government. The old tote road, crossing the new highways here and there, tells silently of the conditions that are past. Arrived at Lake McDonald, three miles within the park, the motorists were loaded into motor boats and taken six miles up the lake to the Glacier hotel for dinner.

The portion of the park-to-park highway opened up to Montana motorists comprises the northern end of the motor road that is to traverse the state from the Yellowstone national park at the southern boundary to the Glacier national park at the north. The completed part passes through some of the most wonderful scenery to be found anywhere, and when the entire road is opened next year it will become one of the most famous highways in the country.



NATIONAL FOREST RESERVE NEAR BELTON

The Flathead Motor Club deserves the credit for the construction of this part of the highway. One hundred and thirty thousand dollars were spent in Flathead county alone on the roads and bridges this year, and practically all of it represented work on the 38-mile section of the park-to-park road. Thirty thousand dollars were expended on the construction of 15 miles of new road. Where the road had to be cut along the canyons out of the face of the living rock, each mile represented an expenditure of over \$3,000, while through the side hills the cost of alternating cut and fill was \$1,000 per mile. A like amount was spent in the construction of each mile of the forest roads.

The federal government built the 3-mile portion of the road in the Glacier park from Belton to Lake McDonald through a thick pine forest at a cost of \$20,000. Of the \$130,000 spent by the Flathead Motor Club \$1,500 was donated by the members of the club and the remainder was from the county funds.

WANTS ROUTE TO TAMPA, FLA.

Monte Vista, Colo.—Editor Motor Age—Can Motor Age furnish me the best route from Pueblo, Colo., to Tampa, Fla., by way of St. Louis, Mo., and Nashville, Tenn?—M. F. Powell.

There are two across-Kansas routes for you to take your choice. One is the Santa Fe trail over which the Kansas City Star tour passed in 1910. The roads are kept in first-class condition and in many places the culverts are of extra length so as to keep the road grades of good width. Motorists will find it well sign-boarded so as to guide them on their way. The intermediate towns are as follows: Pueblo, Fowler, La Junta, Las Animas, Hasty, Lamar, Morse, Grenada, Lamar, Holly, Syracuse, Hartland, Garden City, Cimarron, Howells, Sears, Dodge City, Spearville,

Touring Club Road Information

NEW ENGLAND.

NEW HAVEN to **Hartford**: State road all the way in fine condition.

Hartford to **Springfield**: Good condition,

Springfield to **Greenfield**: Good condition to Mount Tom station. Badly worn between Mount Tom station and Northampton. Detour necessary north of Hartford on account of road improvement. Detour well posted.

Greenfield to **Concord**: State road to Hinsdale. Good dirt road Hinsdale to Keene. Keene to Concord fair to good dirt road, several short stretches of sand. Improved in several sections since 1910.

Dover to **Wells Beach**, via **South Berwick** and **Northboro**: Good dirt road to Northboro, with several short stretches of sand the remainder of the distance.

Ossipee to **Center Harbor**: Fair to poor dirt road, somewhat hilly.

Plymouth to **Franklin**: Mostly state road entire distance. Road service unusually good for amount of travel given at this season.

Franklin to **Claremont**: Fair dirt road. Several short stretches of sand and numerous narrow, winding stretches of roadway.

Claremont to **Littleton**: Fair to good dirt road to Hanover, with new state road to Lyme. Remainder of the route good dirt road, with one or two short stretches of macadam.

Lisbon to **Sugar Hill** and **Franconia**: Dirt road in excellent condition between Sugar Hill station and Franconia.

Littleton to **St. Johnsbury**: Mostly dirt road and in fair condition. The Blue Book has omitted two important turns on this line after the mileage point 13.1. After right fork at iron watering trough, tourist meets a second fork, keep right and take next left-hand road. The remainder of the route satisfactory.

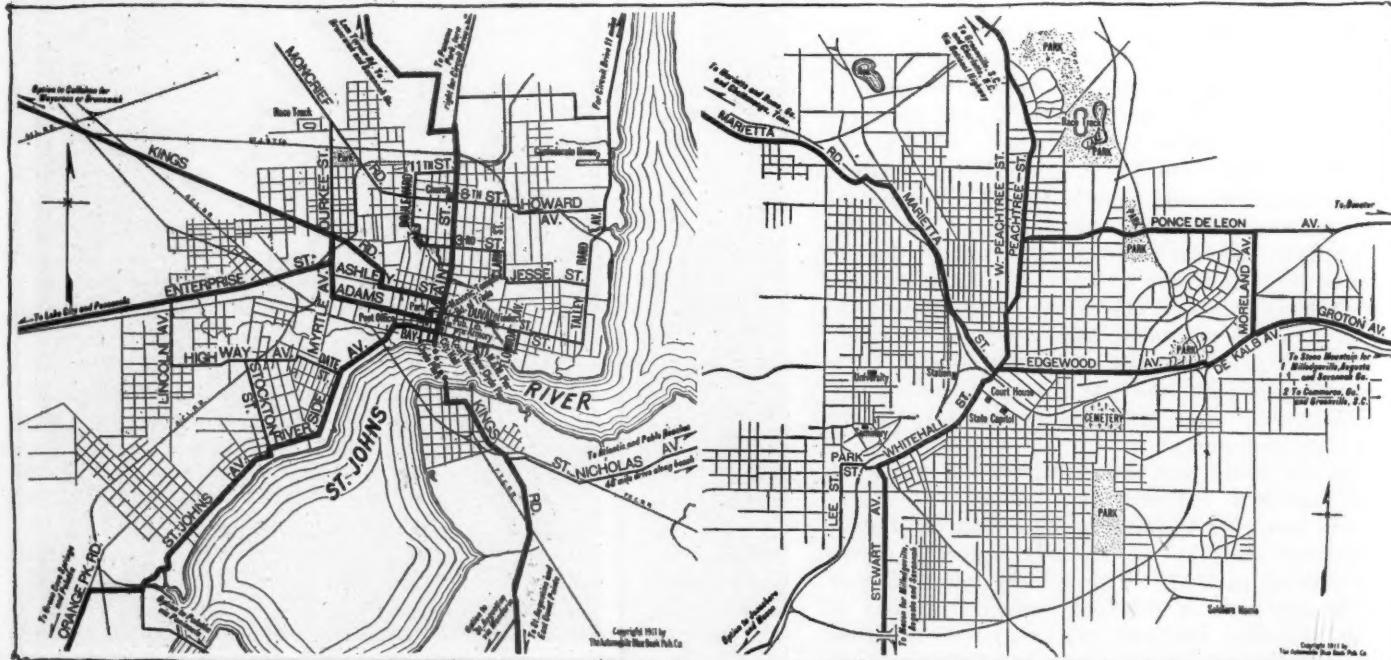
St. Johnsbury to **Burlington**: Fair dirt road all the way, with numerous general road improvements all along this line.

Offerle, Garfield, Pawnee Rock, Dundee, Great Bend, Ellinwood, Lyons, Sterling, Hutchinson, Halstead, Newton, Walton, Peabody, Florence, Clements, Elmdale, Cottonwood Falls, Saffordville, Emporia, Waverly, Agricola, Williamsburg, Ransomville, Homewood, Ottawa, Wellsville, Edgerton, Gardner, Olathe, and Kansas City. The trail a trifle north of this is the one over which the Kansas City Star tourists returned and will take you to Colorado Springs from Pueblo through Eden, Bragdoo, and Fountain, thence east to Calhan, Ramah, Mattison, Resolis, Limon, Hugo,

Mirage, Boyero, Ayra, Wildhorse, Kit Carson, First View, Cheyenne Wells, Arapaho, Weskan, Sharon Springs, Wallace, McAllaster, Winona, Page City, Monument Oakley, Grinnell, Grainfield, Buffalo Park, Quinter, Collyer, Voda Wakeeney, Ogallah, Ellis, Hays, Walker, Gorham, Russell, Dorrance, Wilson, Ellsworth, Kanapolis, New Cambria, Solomon, Abilene, Chapman, Junction City, Ogden, Manhattan, Wamego, Topeka, Newman, Lawrence, Eudora, De Sota, Cedar Junction, Monticello, Zarah, Shawnee and Kansas City.

The traveled road between Kansas City and St. Louis takes you through Independence, Blue Springs, Odessa, Higginsville, Corder, Blackburn, Shackleford, Marbee, Clark, Mexico, Martinsburg, Wellsville, New Florence, Jonesburg, Warrenton, Wright City, Wentzville and St. Charles. From Kansas City to St. Louis is 310½ miles, and you will experience no difficulty in making this stretch in dry weather. St. Louis to Louisville takes you through Belleville, Shiloh, Lebanon, Trenton, Breeze, Buxton, Carlyle, Clinton, Shattuck, Salem, Flora, Noble, Olney, Lawrenceville, Vincennes, Wheatland, Washington, Montgomery, Cannonsburg, Loogootee, Shoals, Huron, Mitchell, Orleans, Paoli, Hardinsburg, Fredericksburg, Palmyra, Greenville, Galena, Mooresville, New Albany, and Louisville. This detour from Loogootee to Paoli is made in order to eliminate 25 miles of very bad hills into French Lick Springs which is dangerous on account of the rocky surface.

Mount Washington, Bardstown, New Haven, Buffalo, Canmer, Bear Wallow, Cave City, Mammoth Cave, Glasgow Junction, Bowling Green, Goodlettsville, take you to Nashville. Nashville to Savannah, Ga., is as follows: Murfreesboro, Shelbyville, Fayetteville, Meridianville, Huntsville, Mayfield Paint Rock, Woodville, Larkinsville, Scottsboro, Bridgeport, Jas-



MAP OF JACKSONVILLE, FLA., SHOWING VARIOUS ENTRANCES

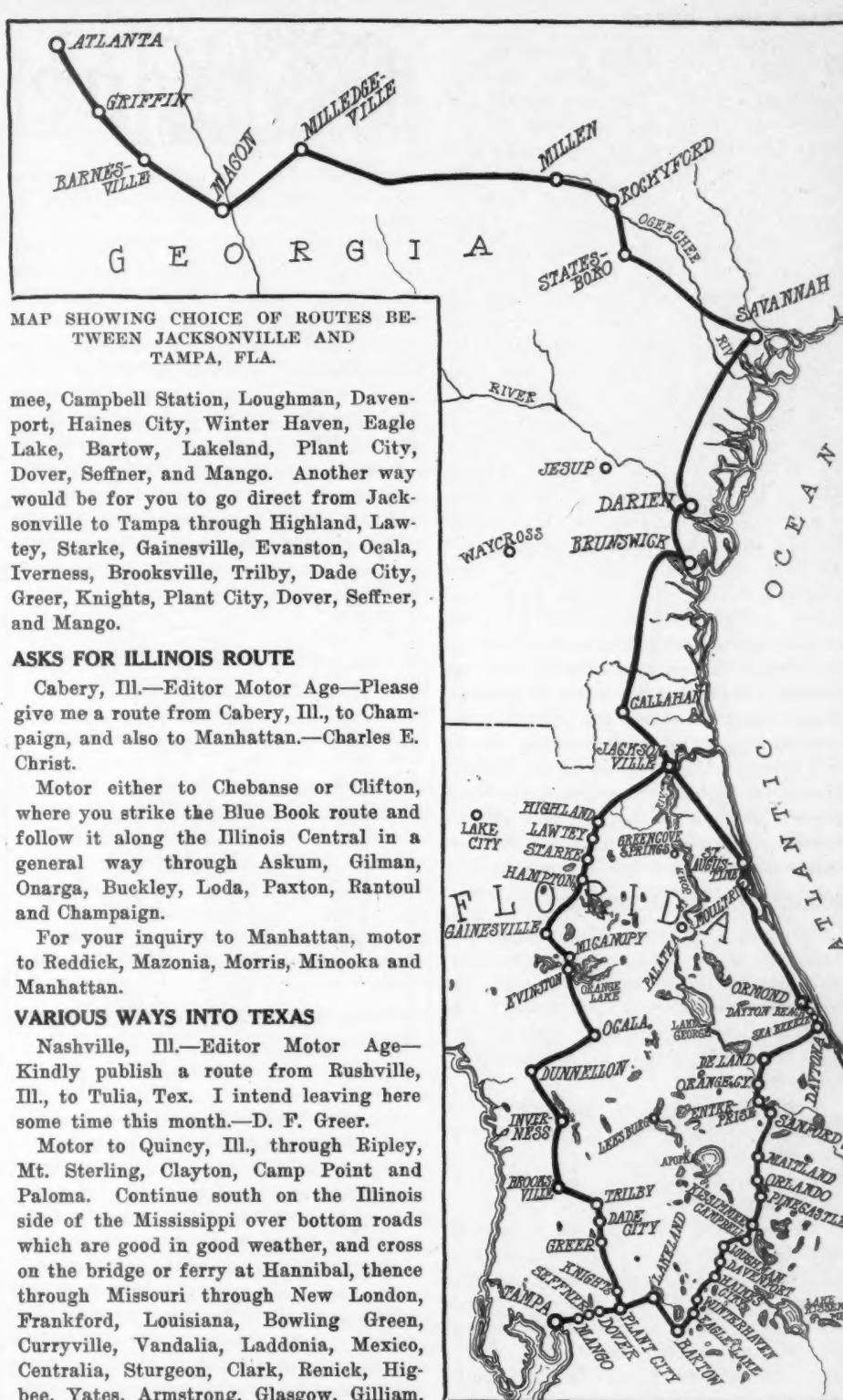
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MAP OF ATLANTA, GA., AND ENVIRONS

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per, Rankin's Ferry, Chattanooga, Lafayette, Summerville, Rome, Kingston, Cartersville, Acworth Kennesaw, Marietta, Atlanta, Decatur, Ingleside, Scottdale, Clarkson, Stone Mountain, Redam, Laethonia, Conyers, Covington, Social Circle, Rutledge, Eatonton, Milledgeville, Sandersville, Davisboro, Louisville, Waynesboro, Perkin, Millen, Scarboro, Rockyford, Statesboro, Pretoria, Stilson, Blitchton, Eden, and Savannah. At Savannah on November 27 will be run the Vanderbilt road race, and on November 30 the Grand Prix, and unless you intend to make the trip right away, you might time yourself in order to get there for those well-known events.

From Savannah you will take the coast trip to Daytona, Fla. Just outside of Daytona is Ormond Beach where Oldfield and later Burman made the beach records. The intermediate towns are Riceboro, Eulonia, Darien, Brunswick, Old Sterling, Tarboro, Owens Ferry, Kings Ferry and Callahan, Jacksonville, St. Augustine, Moultrie, Ormond, Sea Breeze and Daytona. Continue to Tampa through DeLand, Orange City, Enterprise, Osteen, Sanford, Longwood, Maitland, Orlando, Pine Castle, Kissim-



mee, Campbell Station, Loughman, Davenport, Haines City, Winter Haven, Eagle Lake, Bartow, Lakeland, Plant City, Dover, Seffner, and Mango. Another way would be for you to go direct from Jacksonville to Tampa through Highland, Lawtey, Starke, Gainesville, Evanston, Ocala, Iverness, Brooksville, Trilby, Dade City, Greer, Knights, Plant City, Dover, Seffner, and Mango.

ASKS FOR ILLINOIS ROUTE

Cabery, Ill.—Editor Motor Age—Please give me a route from Cabery, Ill., to Champaign, and also to Manhattan.—Charles E. Christ.

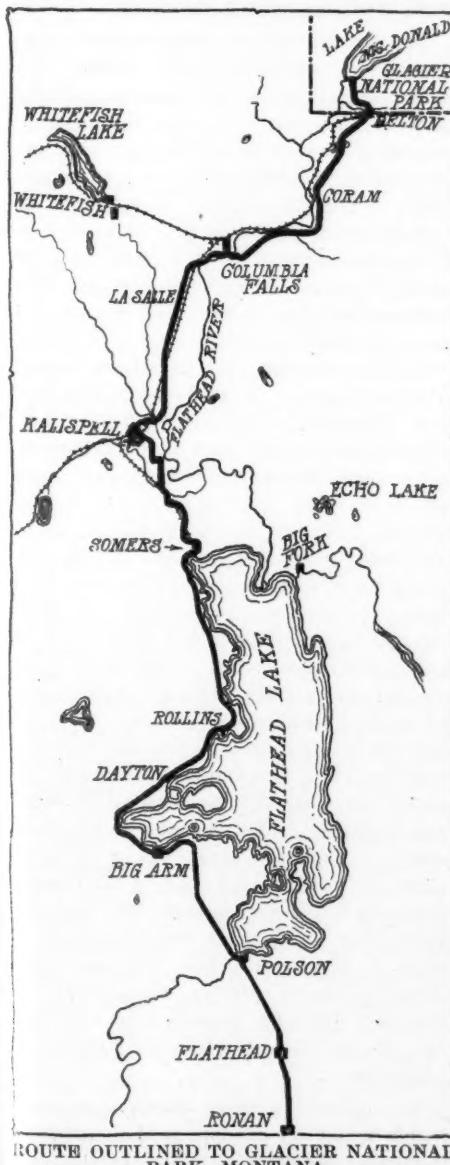
Motor either to Chebanse or Clifton, where you strike the Blue Book route and follow it along the Illinois Central in a general way through Askum, Gilman, Onarga, Buckley, Loda, Paxton, Rantoul and Champaign.

For your inquiry to Manhattan, motor to Reddick, Mazonia, Morris, Minooka and Manhattan.

VARIOUS WAYS INTO TEXAS

Nashville, Ill.—Editor Motor Age—Kindly publish a route from Rushville, Ill., to Tulia, Tex. I intend leaving here some time this month.—D. F. Greer.

Motor to Quincy, Ill., through Ripley, Mt. Sterling, Clayton, Camp Point and Paloma. Continue south on the Illinois side of the Mississippi over bottom roads which are good in good weather, and cross on the bridge or ferry at Hannibal, thence through Missouri through New London, Frankford, Louisiana, Bowling Green, Curryville, Vandalia, Laddonia, Mexico, Centralia, Sturgeon, Clark, Renick, Higbee, Yates, Armstrong, Glasgow, Gilliam, Slater, Marshall, Shackleford, Mt. Leonard, Blackburn, Corder, Higginsville, Mayview, Odessa, Oak Grove, Grain Valley, Blue Springs, Independence, Centropolis and Kansas City. Following the Glidden tour route of 1910, pass through Rosedale, Marriam, Shawnee, Lenexa, Pleasant View, Olathe, Bonita, Gardner, Edgerton, Wellsville, Ottawa, Ransomville, Williamsburg, Silkville, Agricola, Waverly, Lebo, Emporia, Plymouth, Florence, Peabody, Elbing, Newton, Wichita, Peck, Riverdale, Wellington, Drury, Caldwell, Renfrow, Medford, Pond Creek, Kremlin, Enid, Orlando, Mulhall, Guthrie, Edmond, Britton,



ROUTE OUTLINED TO GLACIER NATIONAL PARK, MONTANA

Oklahoma City, Yukon, El Reno, Mineo, Pocasset, Chickasha, Verden, Ananarko, Apache, Rohrer, Lawton, Geronimo, Walter, Temple, Hastings, Waurika, Wichita Falls, Vernon, Quanah, Childress, Clarendon, Amarillo and Tulia.

If you want to go to Denver you will find a map in the issue of September 21 giving two routes across Kansas and into Colorado. At Limon, Colo., motor through River Bend, Cedar Point, Godfrey, Agate, Deer Trail, Byers, Bennet and Magnolia for Denver. Continue to Colorado Springs, thence Pueblo, Trinidad, Eaton, Capular, Dedman, Texline and Amarillo.

REAR WHEEL REPAIR

BREMEN, IND.—Editor Motor Age—Is there any way by which the rear wheels on a model T Ford can be kept perfectly tight under the conditions as follows: The Ford T rear hub, not being a solid hub, does not bear the full length of the rear spindle. My hub is larger than the spindles, thus the key becomes loose. I have had taper reamers run through pin holes and put in taper pins, with no effect. I have seen many cars laboring under the same defects and believe a permanent method will be greatly appreciated by many readers. A larger key has been tried without avail.—W. E. Nichols.

This question has been answered several times in these columns. The trouble is due to the fact that the pins passing through the axle are and should be made of soft steel so that they will not crystallize and allow the wheels to come off, but the long square key should be of hard steel and closely fitted. Have a new key closely and properly fitted, and have the pin hole reamed out and a new pin put in.

A reader advises that after having the new key fitted, that the holes in the hub be cut out with a rattrail file until they are oval in shape, the long diameter of the oval being in the direction of the circumference of the hub. Then have pins fitted through the end of the hub and axle so that they will fit tightly in the latter, but loosely in the oval holes in the hub.

HUDSON VALVE ADJUSTMENT

COLUMBUS, O.—Editor Motor Age—Will Motor Age kindly tell me, through the Readers' Clearing House, how I can make the valve adjustment stay on a Hudson 33? The locknut will not stay locked. Also how can I get rid of the hum in the differential?—Subscriber.

A sectional drawing of the Hudson valve tappet as shown in Fig. 1, and it is possible that instead of screwing the nut N down against the top of the valve tappet T, you have turned it up against the head S of the adjusting stud. It also is possible that the threads in the valve tappet have been damaged by running the motor with the nut N loose, in which case either a new valve tappet will be required, or the old tappet must be rebored and tapped, and a larger stud and nut fitted. Should there be too much space at E between the head S of the adjusting stud and the end M of the valve stem, this, too, would tend to loosen up the locking nut N, providing it was not properly tightened in the first place. The space E should not be greater than the thickness of an ordinary business card. If, however, on adjusting the tappet by using a business card for a gauge, you should find that the motor seems to be less powerful when it becomes warmed up, test the space between the valve stems and tappets with a piece of very fine tissue paper while the motor is hot. The valve stems of a motor become slightly elongated as the motor warms up, and they sometimes extend themselves to such a length that the valves are



not permitted to close tightly. The result is poor compression and consequent lack of power.

If your car is an old one or has seen considerable service, it is possible that the hum in the differential is due to worn gear-teeth, or worn bearings, or both, in which case the noise cannot be entirely eliminated except by a replacement of these parts. By using some of the prepared graphite grease on the market, or some prepared by yourself by mixing flaked graphite with cylinder oil and grease, in proportions of about $\frac{1}{2}$ pound of graphite, 1 pound of grease and 1 pint of cylinder oil, the noise may be considerably reduced. The driving-gear housing of the

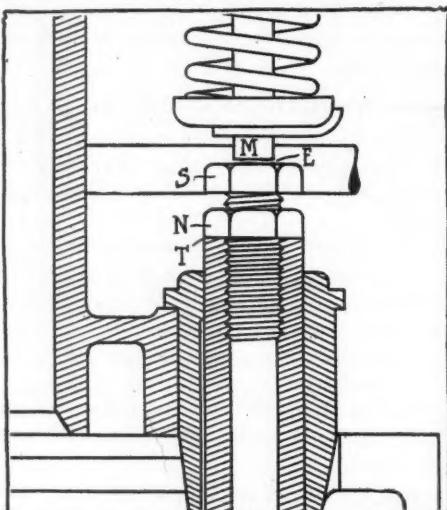


FIG. 1—ADJUSTMENT OF HUDSON VALVE TAPPET

rear axle should be kept about one-third full of this compound; but before putting it in it would be advisable to flush out the old grease or oil with a squirt gun and kerosene. The latter operation would be greatly facilitated if you were to disconnect the universal joint at the front end of the propeller shaft, then remove the torsion tube and driving pinion from the driving-gear housing. This makes a large opening in the driving-gear housing that would permit of easy cleaning and inspection of the mechanisms therein. In order that you may be more familiar with the construction of your rear axle, the various features are shown dis-assembled in Fig. 4.

REMEDY FOR CHATTERING CLUTCH

KALAMAZOO, Mich.—Editor Motor Age—I am a regular subscriber of your paper for the past 4 years, and wish to ask a question for the trouble department. I drive a Reo 30 and when changing from one speed to another, unless I slow my motor down, the plates in the clutch chatter. I have put in cylinder oil and then washed it out with kerosene, but it does not seem to make any difference. The clutch never slips on a hard pull or hill

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired

after it once gets a good hold.—W. A. S.

This chattering noise is caused by the plates becoming cut or roughened. Motor Age would advise that the plates be taken out and smoothed off with emery cloth. These plates will wear smooth sometimes after becoming roughened, by putting in a little cylinder oil and using the clutch a day or two. The cylinder oil has a tendency to cause the plates to slip, and thus remove the rough spots which have formed on them.

HAS TROUBLESOME KNOCK

MINNEAPOLIS, MINN.—Editor Motor Age—As a Motor Age subscriber I should like to put a question to the Readers' Clearing House: My car is a 1910 Moline and a knock developed some time ago which I attributed to either carbon or a loose bearing. I had the engine taken down, the carbon removed, valves ground, new piston rings fitted and all bearings inspected. No loose bearings were found and not much carbon, but the knock still remains. It does not seem possible that it is caused by a loose bearing as the repairman reports the bearings O. K. besides the knock is not noticeable at all times. The car will take a hill or any hard pull all right on high with the spark well advanced, and no knock can be noticed. On a level stretch, however, as the throttle is opened the knock will start, but on retarding the spark more than half way down the quadrant the knock will cease, when the throttle can be opened full and 40 or 50 miles per hour obtained. But if the spark is advanced only a trifle while going at a speed of over 20 or 25 miles per hour, the knock will return. At times when the engine is running idle, the clutch disengaged, the knock can also be heard, especially when the engine is cold. I can run on the lever with an advanced spark up to 15 or 20 miles per hour, but on opening the throttle more the knock will appear. The strangest part of it is that the engine cannot be made to knock on a hill. My carburetor seems to be in perfect adjustment, although I did have trouble with it a year ago and sent it to the Schebler factory for inspection.

The ignition system—Bosch dual—with which I had my car equipped seems to be in perfect condition. I will appreciate any

Clearing House

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

information or light on the subject Motor Age can give me.

Kindly inform me whether or not any American motor car factory has adopted the Mead rotary valve motor and the name of the factory.—A Knock.

It is indeed difficult to arrive at a logical diagnosis of the knock of which you complain. It is possible that the timing of the ignition system is set very much in advance of what it should be though not sufficiently to cause a back kick. Trouble similar to yours also has been brought about by a loose engine leg bolt which would permit the leg of the motor to vibrate at certain motor speeds, just as the lamps or fenders of some cars often can be made to vibrate at certain speeds. A loose transmission-shaft bearing also has been known to cause knocking at certain speeds and run very smoothly at other speeds. The timing, however, seems the most reasonable cause of your trouble, it may be that at some time the driving gear of the magneto has been unmeshed, and improperly meshed again, and that it might require setting back a couple of teeth.

Motor Age has no record of any manufacturer of motor cars having adopted the Mead motor as yet.

STOCK CHASSIS OPTIONS

DuBois, Pa.—Editor Motor Age—I would like to express my views upon a subject that I think the buying public is being greatly imposed upon, not only by the manufacturers, but by the technical committee of the American Automobile Association. For a number of years motor car contests have been carried on under the name of stock chassis races, when in reality the only thing of stock were the design and dimensions of engines.

Looking over the so-called stock cars, we find, first, smaller wheels, special rims, invariably a very small gear ratio, a carburetor which looks stock but upon examining the gas nozzle one finds it full of small holes with an extra air inlet, doctored gasoline and, in fact, the car is doctored from end to end especially for this event. Is not this a misrepresentation to the buying public?—W. J. Marlin.

There is not any deception in stock chassis races. The technical committee requires the cars to come to the standard

as required on page 7 of the 1911 contest rules. As you may not be aware, these rules allow certain changes or options because of the entirely different conditions under which the cars operate. These options are as follows:

Lighter springs—number of leaves optional; thickness, width and length must be standard.

Piston diameters may be lessened, form of rings and number of oil grooves, etc., must be standard.

Angle of steering post.

Length and angle of change gear, brake and other control levers (method of control must be standard).

Driving gear ratio, wheel diameters excepted. Where a gear ratio is changed on a shaft driven car, any gear ratio may be used of which the standard axle construction will permit.

Tire and rim equipment.

Length of clutch, brake, accelerator and other pedals.

Body equipment: contour of dash, seat and body optional, but floor boards must be carried.

Form, volume and location of fuel and oil tanks—system employed in either case must remain unchanged.

Exhaust header and exhaust pipe—optional, except exhaust must be conducted

Special wheel fenders or radiator protectors of any design may be used, wind shields excepted, provided they are attached to the car in a manner satisfactory to the technical committee.

A careful analysis of these options will show that they are allowed in order to make racing with stock cars safer. The driver and mechanician must sit lower, consequently the angle of the steering pillar must be adjusted. This calls for changing the length and angle of the control levers. Larger fuel and oil tanks are allowed in order to make the contest a real one. Shock absorbers are permitted because of the lighter weight and higher speed of the stripped chassis. Winding of springs is permitted for the same reason. Bonnet straps are made imperative because of the danger of loosening the bonnet. Option on tires and rims is given, although the size of tire cannot be changed. No change in the size of the carburetor is allowed in stock chassis races.

REMOVING ALKALI DEPOSITS

Santa Barbara, Cal.—Editor Motor Age—Kindly answer the following questions through the Readers' Clearing House:

1—Motor Age gives the formula of

D^2N

standard horsepower formula. Has the length of the stroke nothing to do with the power? For instance, would two engines, one with a $3\frac{1}{4}$ bore and 4-inch stroke develop the same power as a 4 by 4-inch bore and stroke?

2—What is the formula for the French rating?

3—What do the English cars reckon their horsepower on, one of the above or one of their own?

4—Will water with considerable alkali in it be inclined to choke a radiator? If so, what will remove it?

5—Where can I obtain a cheap appliance to fasten on my car to measure grades?—Reader.

1—This formula, which is now known as the S. A. E. formula, does not take into consideration directly either the length of the stroke or the speed of revolution of the crankshaft. Two motors of the same bore will have the same rating by this formula, no matter how much they vary in stroke and speed. In practice, however, the actual horsepower developed by a motor is dependent upon both of these factors.

2—The French make use of the same formula, except that they frequently divide by 3 instead of 2.5.

3—The R. A. C. formula, by which motors are rated in England, is exactly the same as the S. A. E. formula,

2.5

although it is usually put in the form H. P. = $0.4D^2N$, which means the same.

4—The common alkali are soda and potash, both of which may form incrustations

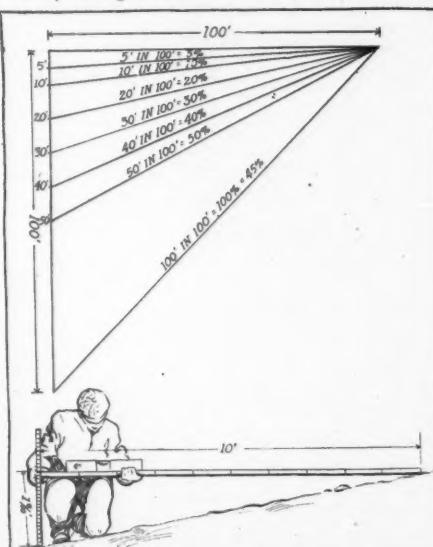


FIG. 2—HOW TO MEASURE THE PERCENT OF GRADE

outside the bonnet and so directed as not to raise dust.

Use of shock absorbers.

Winding of springs only—winding of manifolds, fuel and water pipes or electrical connections must be standard.

Bonnets must be carried throughout a contest, but may be cut away at the side for the passage of exhaust pipes only.

Bonnet straps must be added and approved by the technical committee.

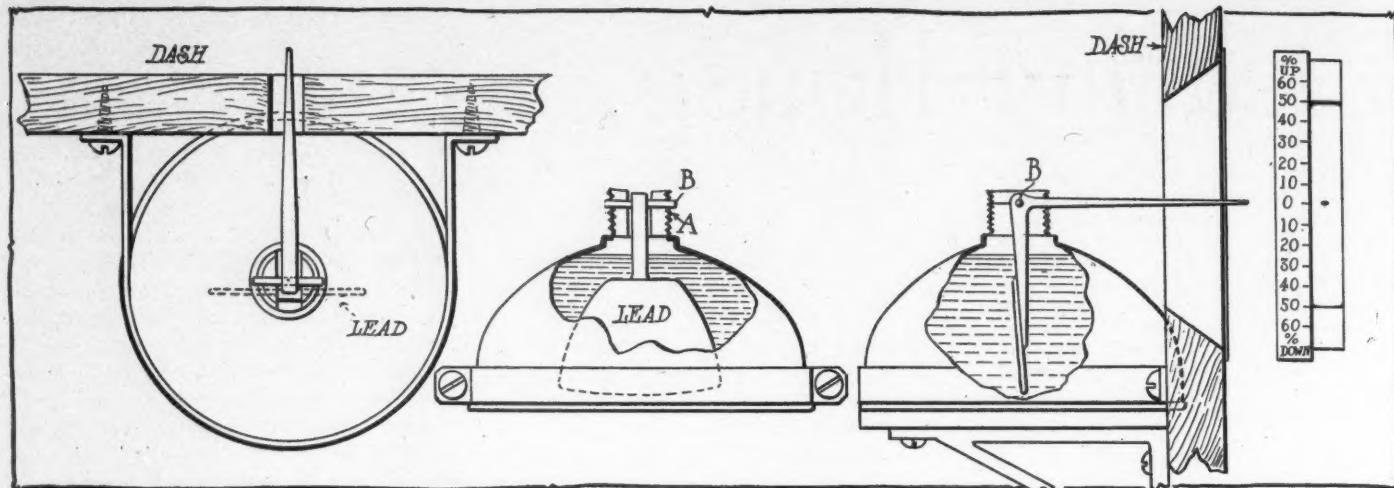


FIG. 3—DETAILS OF HOME-MADE GRADOMETER CONSTRUCTED FROM AN OIL CAN

in the cooling system. The simplest solution would be to use wood alcohol in the jackets and radiator, as both soda and potash are soluble in it. Alkali incrustations have been removed by forcing a current of water through the system which has been done by attaching a hose to the water intake to the jackets of the cylinders. A common force pump has also been used with satisfactory results. In case these methods are unsuccessful it will be necessary to send a sample of the water to the maker of a boiler compound for diagnosis.

5—Motor Age does not know of any gradometer on the market. See communication from S. H. D., Denver, Colo., on this page for construction of home-made gradometer.

HOME-MADE GRADOMETER

Denver, Colo.—Editor Motor Age—One often runs across a hill or grade while touring, especially in this country, of which it would be interesting to know the percent of grade. Of course you can get out of the car and measure the grade, but it is usually too much trouble.

Some weeks ago I made a very satisfactory gradometer which was attached to the dash board of the car and now indicates the percent of grade at all times. It is accurate enough for ordinary purposes and a glance at the indicator on the dash is all that is required. As it is very easily made, I thought other motorists might like to know how to make one.

The general arrangement is shown at the right of the sketch, Fig. 3, in which it will be seen that the device is mounted on the dash under the hood, the pointer extending through a slot in the dash. The only part of the gradometer to be seen on the dash is the indicator, consisting of the end of the pointer and the scale which shows the per cent of grade.

The sketch is reduced to exactly two-thirds full size. The main portion is an old oil can without the nozzle, the threaded portion being drilled horizontally at A to receive a metal pin B upon which the pointer is hinged. The pointer is cut out of sheet brass with the arms at right

angles and drilled at the vertex of the angle to receive the pin. The horizontal arm should be $1\frac{1}{8}$ inches long and tapered to a point. The vertical arm, which hangs in the can, may be of any convenient length and to the lower end is fastened a piece of sheet lead. This sheet lead serves two purposes, acting as a pendulum and a counterbalance for the pointer as well as offering a surface to the oil in the can and preventing the pointer from wobbling too much.

To determine how large a piece of sheet lead to use, put on what seems to be too much, put a pin through the pointer and trim off lead till a slight touch will throw it out of balance. Then bend the lead into a small compass so that it can be inserted into the can, when it can be straightened out with a screw-driver. This done, the pin is put through the holes in can and pointer and the ends upset; a slot having been cut in the neck of the oil can for the pointer.

A slot $\frac{1}{4}$ inch wide and 2 inches long is cut through the dash and the scale put on the driver's side of the dash alongside the slot. The divisions of the scale are found by dividing a 2-inch space into 12 equal divisions, each of which represent 10 degrees, as shown at the extreme right of the illustration.

The device is fastened to the dash in such a position that the end of the pointer projects $\frac{1}{4}$ inch through the latter and is opposite the middle or zero point of the scale when horizontal. The best way to fasten the oil can is by means of an iron strap and bracket as shown. All that remains to be done is to fill the can with oil.—S. H. D.

SLIP JOINT DEFINED

Guthrie Center, Ia.—Editor Motor Age—Through the Readers' Clearing House will Motor Age inform me what a slip joint is? —C. H. Prior.

A slip joint is a type of joint employed in a propellershaft on a shaft-driven car, and also employed between the clutch and gearbox. A better name for the joint would be a telescopic joint. It is needed to allow of the clutch sliding rearward for

disengagement. A slip joint is needed in the propellershaft because the distance between the gearbox and the rear axle is greater with a car loaded and the springs flattened than when the car is empty and the springs well arched.

GAUZE PREVENTS BACKFIRES

Middletown, O.—Editor Motor Age—Please answer the following questions through the Readers' Clearing House:

1—How does a wire gauze inserted in bypass prevent crankcase explosions in a two-cycle engine?

2—Won't an automatic valve open on power stroke the same as on the intake stroke?

3—How can aluminum covered running boards be cleaned?

4—Explain a four-wheel drive on electric machines.

5—How are motors attached on a four-wheel drive?

6—What is the difference between horsepower and motor power? How determined?—E. W. Caldwell.

1—A wire gauze has been used successfully for several years on some makes of two-cycle engines to prevent crankcase explosion due to the flame traveling through the bypass channel. It is customary to place the gauze on an angle and not at right angles across the bypass channel.

2—The automatic intake valve will not open on the power stroke because then the force of the explosion is forcing the valve onto its seating. The automatic valve opens on the intake stroke because as the piston descends a partial vacuum is created inside the cylinder and it is this vacuum that lifts the valve off its seating and thereby allows the mixture to enter the combustion chamber.

3—Aluminum covered running boards are best cleaned with a stiff brush, the bristles of which will reach into the corrugations in the board. If grease and oil gets into these corrugations a little gasoline on a coarse cloth is the best cleaner.

4—There are several makes of vehicles that one time or another have used four-

wheel drive. One electric concern using this carries a motor inside of each wheel of the truck, the wheel being a disk type and resembling two huge milk pans placed face to face and leaving an annular space between them. The motor is driven from a pinion on the armature shaft, these pinions engaging racks mounted on the inside of the wheel shell.

5—One phase of this question is answered in the reply to question 4. Where motors are not carried inside of the wheels they are carried on the outside of the hub on brackets on the steering spindles so that as the wheel is turned to right or left for steering the motor turns with the hub, thus eliminating any necessity for a universal joint. The drive from the electric motor to the wheel hub is through a pinion on the armature shaft to a gear on the hub.

6—Horsepower is the unit by which motor power is measured. The unit of horsepower is a definite one for the measuring of motor power. The difference between the two is the same as that between distance and miles. The mile is a unit by which we measure distance and so the horsepower is a unit by which we measure the motor power.

WHY MOTOR RACES

Chicago.—Editor Motor Age—I should like to have answered through the Readers' Clearing House the following questions:

1. Is it possible to substitute alcohol in the place of gasoline in an ordinary motor cycle motor? If so, is there any advantage gained?

2. How would the explosion of a gasoline engine affect brass, were the cylinder made entirely of brass?

3. Why does my engine race when first started, then run for about 10 minutes, and then begin to miss and finally stop, with the adjustments in the same position all the while? Everything seems to be adjusted for a good running.—L. W. Blose.

1. It is possible to substitute the alcohol, but it will not work. Alcohol would be so hard to vaporize in the ordinary carburetor that you would be unable to start the motor.

2. There would be no deleterious effect on the brass were the cylinder of the motor to be made of brass, but Motor Age knows of no advantage to be gained by the use of brass for this purpose. So far cast iron is by far the cheaper and more durable metal for this purpose.

3. Unless you are in the habit of flooding your carburetor before starting the motor, it is difficult to explain the cause of your trouble. This is a very common trouble, however, when the carburetor is flooded by lifting the needle valve or holding down the float to facilitate starting. In this case, owing to the excessively high level in the float chamber, an excessive amount of fuel is contained in the mixture, which causes the motor to run at a high rate of speed until the superfluous

amount of fuel in the float chamber is used up and the regular level reached. Then because the motor is cold the regular mixture will not be sufficiently vaporized to keep it running and it will stop. Another reason for the racing is that during the first few revolutions an excessive amount of unvaporized or condensed fuel will be left in the cylinder, and the motor will run on this until it is exhausted. This is on the same principle as when the motor is primed. You no doubt have noticed that it is possible to introduce a priming cup full of gasoline into each cylinder, and then run the motor to perhaps from twenty to fifty revolutions, when it will stop just as suddenly as it began.

Your trouble is not due to improper adjustment, but to the fact that the motor is cold and the fuel most probably of rather a poor grade.

MEASURING GRADES

Pittsburg, Pa.—Editor Motor Age—Through the columns of the Readers' Clearing House will Motor Age please explain the following points:

- 1—What is meant by per cent of grade, and does it refer to the distance along the slant or on a horizontal line?

- 2—How would I find the grade of a certain hill without too much figuring?—Reader.

- 1—By the per cent of grade is meant the proportion of the rise to the distance traveled forward as measured on the horizontal. That is, if in progressing 100 feet horizontally you go up 5 feet, the grade is 5 per cent. The upper portion of Fig. 2 illustrates the grades of hills with different rises in each run of 100 feet.

- 2—The simplest method, and one which gives results sufficiently accurate for ordinary needs, is illustrated in the lower part of Fig. 2. Procure a straight stick exactly 10 feet in length, a yardstick, and a carpenter's level. At a point on a hill where the roadbed seems to have the same grade as the hill as a whole, place one end of the stick on the ground and hold

the stick horizontal. Then measure the distance from the end of the stick vertically to the ground. Multiply this distance in feet by 10; this is the per cent of grade. For instance, in the illustration the end of the stick is 1 foot 9 inches from the ground, or $1\frac{3}{4}$ feet, roughly 1.8 feet. Consequently the grade is 18 per cent.

CHROME STEEL CONSTRUCTION

Boone, Ia.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following: What is a full chrome nickel steel construction when used in the description of a motor car? In the best makes what parts are of chrome nickel steel. —Mark C. Jones.

By full chrome nickel steel construction, is meant that all parts requiring to be made of hardest and toughest material are of chrome nickel steel. Chrome nickel steel, as the name implies, is an alloy of chromium, nickel and steel. Chromium is used to some extent in the manufacture of steel, as it is found that the addition of less than 1 per cent of chromium materially increases the strength, hardness and elasticity of the product. Nickel steel is unequaled for hardness and toughness; other notable characteristics of it are its resistance to corrosion, which is much greater than that of carbon steel, and the remarkable combination of high resistance to stresses with great malleability and ease of working. Nickel steel, if containing more than 36 per cent of nickel, has the lowest coefficient of expansion known, thus proving an invaluable material for instruments of precision. Chrome nickel steel often is employed in the steering knuckle levers, axles, driving shafts of rear axles, and in motor crankshafts and valves. Nickel steels melt at a lower heat than the corresponding carbon steels; there is less segregation or liquation in them, and hence such steel is suitable for castings on account of its homogeneity. There seems also to be less tendency to form blowholes. Nickel steel forgings though tough are not difficult to machine.

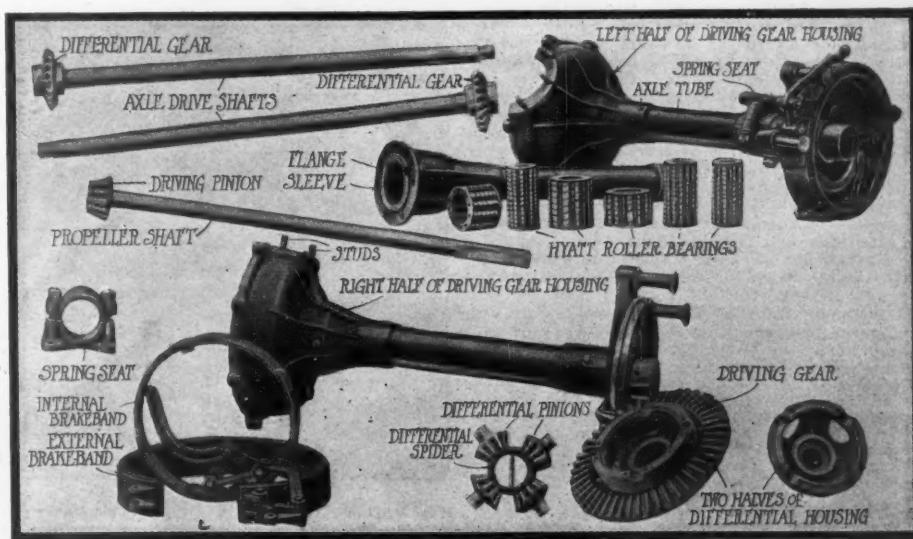


FIG. 4—DETAILS OF THE HUDSON REAR AXLE SHOWING THE VARIOUS PARTS THAT COMPRIZE THE MAKEUP OF THE MECHANISM

Demountable Wheels

Foreign Types of Tire-Changing Devices Described and Illustrated—Rudge-Whitworth Wheel

PART II

By J. S. Critchley

IN Part 1 of this series, published in Motor Age of last week, the general considerations in demountable wheels were given and a complete description with illustrations of the Dunlop wheel given. This section, namely Part II, takes into consideration the celebrated Rudge-Whitworth wheel, which has come into general use, as well as some other types of wheels. In the third and last part of this series other types of demountable wheels, not so well known, will be taken up and illustrated.

The Rudge-Whitworth wheel is of special importance. In Fig. 8 is seen an example of a triple-spoked front wheel which, though one of several types, will be as suitable as any for explanatory purposes. A is the permanent hub revolving upon plainly indicated ball bearings, and B is the wheel hub. At C the driving serrations are indicated, and these are usually about ten in number to each circumferential inch and are cut by special tools with extreme accuracy. The importance of accurate work here, more especially in the case of the rear wheels, need perhaps hardly be dwelt upon, any slight play having a very bad effect upon the parts in contact.

Special Spanner Used

The wheel nut D is circular in shape and has notches cut from its circumference to engage a projection on a special spanner when it becomes necessary to revolve it. This nut has a locking ring L on its inner end, and an angled groove M between the nut and locking ring, carries the turned-over outer end of the

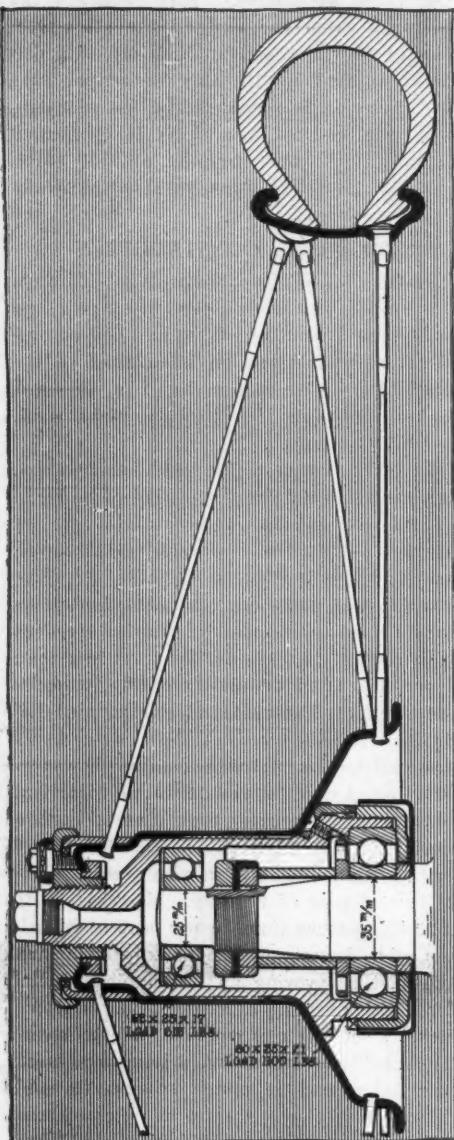


FIG. 8A—RUDGE-WHITWORTH WHEEL

This illustration shows a standard type of the present Rudge-Whitworth wire demountable wheel for a pleasure car. It is a triple-spoke type of wheel, fitted with two races of ball bearings. These wheels can be fitted with roller or plain bearings and are made in the artillery wood type also. The demountable hub is shown in heavy black line and is generally speaking bell shaped with two of the series of spokes fastened to open bell mouth. The other series of spokes attaches to the outer end of the hub. These wheels have what might be called three hub parts. This is a front wheel. The wheel spindle on which are mounted the two races of annular ball bearings, is identical with that used for ordinary wheels. Over this hub and outside of the two bearings is placed the intermediate hub, which when once in place remains on. Lastly comes the demountable hub—shown in black—which is caused to rotate with the intermediate hub by serrations and is held, so as not to come off, by a wheel nut or locking nut. The wheel nut is the safety factor of the wheel because on it depends whether the wheel might come off or not when on the road and so cause a serious accident. This wheel nut has to be relatively simple device in order that the wheel can be quickly taken off and another put on. This wheel nut is so designed that it acts as a hub puller, so that when unthreading the wheel nut the demountable hub is being pulled off. There is therefore not any danger due to wheel sticking. The intermediate hub, designated A in Fig. 8, is held in position by a flange which rests against the outer edge of the inner bearing. This flange is retained by a sleeve on the spindle, which sleeve bears against a nut threaded onto the spindle and is further anchored by a lock nut. It is impossible for this hub to come off. The inner annular bearing is made dust proof by a ring outside of the bearing, this ring being held in place by a lock piece and set screw.

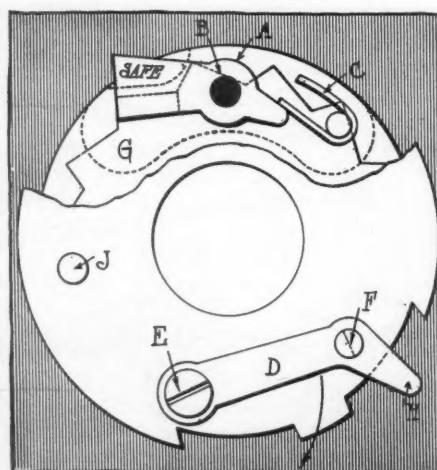


FIG. 9—RUDGE-WHITWORTH LOCK DEVICE

This illustration shows the precaution taken by the Rudge-Whitworth company in providing a safe locking device for its demountable wheels. This device is such that the owner cannot do other than put the wheel on safely

wheel hub. The nut being revolved to the right drives the wheel up onto the permanent hub, and revolution to the left withdraws it. A large screw plug E is provided for lubricating the bearings of the wheel.

Naturally most interest attaches to the locking device of a detachable wheel, and this in the case of the Rudge-Whitworth is extremely ingenious and one would imagine absolutely fool-proof. The device is indicated to some extent in Fig. 8 at F, but it is shown more clearly, though diagrammatically, in Fig. 9. In Fig. 8 it will be seen that there is a steel cap N fixed on the outer end of the wheel hub, and this has a female ratchet G, if I may so call it, cut in its end. It is through the medium of this ratchet that the lock is obtained. The ratchet is indicated at G (Fig. 9) and has to engage with its teeth a pawl A mounted on a small bolt B well secured to the wheel nut. The pawl engagement nose is a piece bent back and shown dotted in the diagram. The pawl is kept in engagement usually by the spring C. These parts form the automatic part of the lock, but there is as well a hand-operated lock represented by the lever D, pivoted at E on the wheel nut. This lever has at F a catch which engages normally with one or other of the teeth of the ratchet wheel, and so effectually prevents movement of the nut in either direction. The hand-locking lever D has on its movable end a nose-piece H, which projects beyond the circumference of the wheelnut, and whose purpose will be shortly described. Thus has this wheel a double locking arrangement—one automatic in action and one to be performed by hand.

In order to observe the working of these parts, let us suppose that the wheel is to be removed: As before mentioned, a spanner is employed having an opening to suit the wheel nut, but this cannot at first be placed upon the nut on account of the projection of the nose H of the small lever; this lever is therefore swung round in the direction of the arrow until its catch engages in the depression J. The nose of the lever is now no longer an obstacle to the attachment of the spanner and the movement of the lever has partially unlocked the wheel nut. The first few degrees of movement of the spanner to rotate the wheel nut serves only to depress the exposed end of the pawl A and thus to disengage it from the ratchet teeth. The nut may now be revolved freely until the wheel becomes detached.

There is an important and interesting detail that has so far not been mentioned. The pawl springs, etc., are usually covered by a small box shown dotted in Fig. 9; on its upper side this box is slightly cut away to expose the free end of the pawl. When the pawl is properly engaged in the teeth of the ratchet this free end is visible and not otherwise; the free end has the word safe stamped upon it, so that it is easy to satisfy oneself as to whether the pawl is engaged or not at any time. In tightening the wheel into position the spanner must be manipulated until the wheel is hard up, and then if the word safe is not exposed a few strokes of a mallet are necessary, but the direction of the spanner must never be reversed when the wheel is being attached, as the effect is to disengage the pawl. The teeth of the ratchet and the twin locking devices are so arranged that when one is engaged the other may also be engaged, so that as soon as the word "safe" appears after the tightening up process, then may the small hand locking lever be turned round into its locked position.

Recently a somewhat modified form of hand-locking device has been introduced by the Rudge-Whitworth Co., though the automatic lock has proved so satisfactory that no alteration has been deemed necessary. The alteration consists in arranging the small lever D, instead of swinging round 180 degrees or more to an out of action position, to merely swing slightly toward the center of the hub, and in this position the nose H engages with a projection on the spanner, so that the wheel cannot become locked while the spanner is in position. It is of course important that this should be the case, for pressure

on the end of a somewhat lengthy spanner while the wheel was locked must result in some damage to the small and somewhat delicate locking pieces.

It will be realized that the pawl box, as well as the hand-locking lever, projects slightly beyond the outer face of the hub, and might therefore be liable to damage in traffic; but if these cases occur one does not hear of them, and these wheels are beyond doubt used in very large numbers, and as proof of the very excellent success that has attended their use, readers are referred to the results of the race for the grand prix des voitures held in Boulogne recently. The first four cars were fitted with Rudge-Whitworth demountable wheels, and it is interesting to note the rather extensive gap of time between the fourth and the fifth cars—23 minutes 11 seconds—that is, between the last of the cars fitted with demountable wheels and the next car not so fitted.

The Swift Wheel

A very simple design of demountable wheel is in use by the Swift Motor Co., Ltd., and though it may not be possible to detach it with equal rapidity to that of some other types, yet it possesses great simplicity, and for that reason alone is worthy of mention. It will be seen as well that there are no small pawls or catches of any kind, which fact will appeal to some as being advantageous.

The permanent hub has at its inner end a large-diameter flange, and this is provided with four fixed bolts having at the other ends nuts and locking washers. One of these bolts has a slightly larger diameter than the remaining three, so that the wheel, in being replaced, may

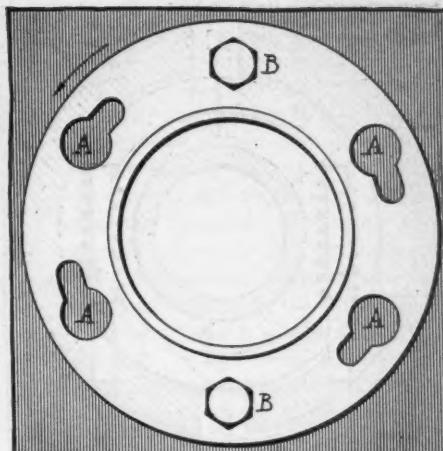


FIG. 10—SWIFT DEMOUNTABLE WHEEL

This illustration only shows the locking device on the Swift demountable wheel, which wheel is held to the permanent hub by four bolts regularly spaced at 90 degrees to one another. An artillery type of wheel is used

always register correctly. The wheel itself is of the usual artillery pattern and slides on over the permanent hub; it has of course four holes, to allow the bolts and nuts mentioned to pass through. After the wheel has been put into place a special locking plate is placed on it. A view of this appears in Fig. 10. The four slotted holes A shown are spaced to suit the bolts mentioned, the enlarged ends being of sufficient size to allow the nuts to pass through. When the plate has been positioned on the wheel it is turned a few degrees in the direction of the arrow, so as to bring the small ends of the slots under the nuts and washers. The four nuts are now tightened and the wheel is ready for the road. The locking plate is turned by the application of a spanner to either one or other of the two dummy nuts B attached to it, so that no special tool is required for wheel changing, and this must be regarded as another advantage of this simple wheel.

The advantage of a hub cap for a detachable wheel which shall be quite free from projections has been before insisted upon, and the Dunlop wheel is particularly good in this respect. The wheel produced by the Goodyear Motor Wheel Co. also excels in the same direction. There are here no projections on the face of the hub, a position where they are beyond doubt most likely to meet with an accident, and those on the hub circumference are such as are not in the least likely to suffer.

Since the Goodyear company is and has been for a considerable time past a wheel manufacturer, it is not surprising that the demountable wheel should meet with pretty thorough treatment at its hands. Not only are both wire and wood wheels turned out at the Dudley factory, but three alternative driving systems are employed, the permanent hubs being either provided with solid keys eight in number, with serrations or with semi-circular notches which engage projections upon the face of the wheel. All these methods

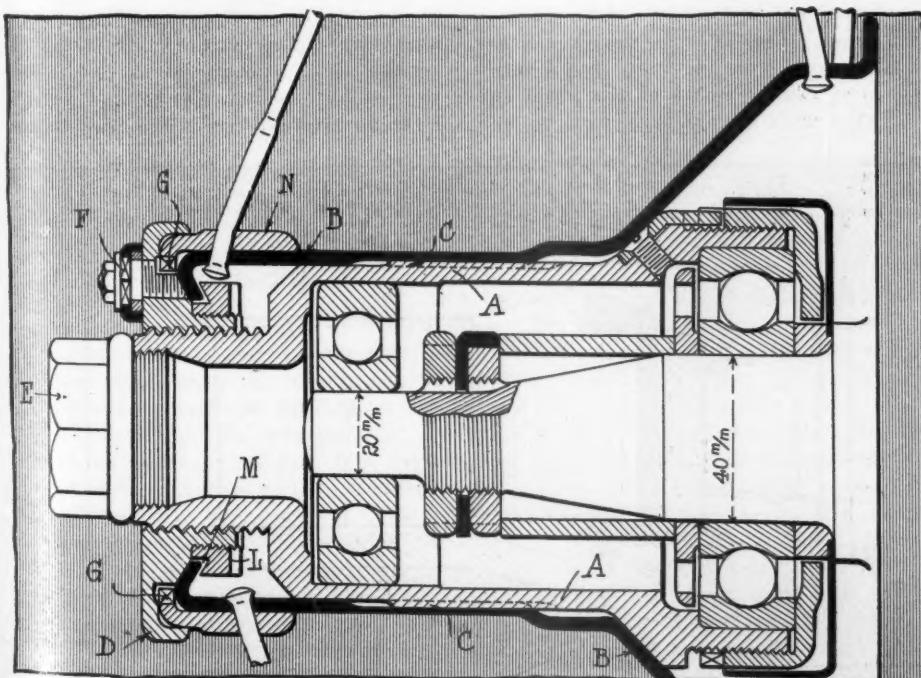


FIG. 8—HUB OF RUDGE-WHITWORTH WHEEL

In this wheel A is the permanent hub rotating on two races of ball bearings; B is the demountable wheel hub attached to which are seen the inner ends of three wire spokes; at C are seen the driving serrations where the hub B slips over the hub A; and D is what is called the wheel nut, that is the locking device by which the demountable hub B is held in place

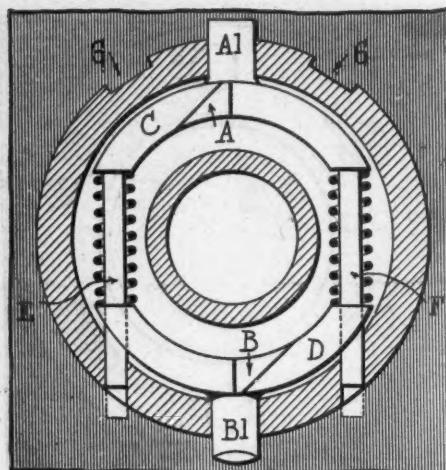


FIG. 11—GOODYEAR DEMOUNTABLE WHEEL

This illustration only shows the locking device employed on the Goodyear wheel. The hub is not illustrated, as it is a standard type and is made interchangeable with other types of demountable wheels. The demountable hub is anchored by serrations, keys or notches

of driving have been proved successful, and each has its own field of usefulness.

The details of the hub of this wheel bear such similarity to the details of other wheels, and indeed the hubs are actually made replaceable with those of another well-known make, that no illustration is necessary, and a face view of the locking device only is shown in Fig. 11. First there are duplicate catches on pawls A and B, which engage when locked with an internal ratchet wheel on the wheel hub, not shown. Each of the pawls A and B form part of a crescent-shaped piece snugly concealed inside the wheel nut, the pawl A being attached to C and the pawl B to D. The crescent-shaped pieces have on their larger diameters pins formed, Al and Bl, which project through the casing of the nut. The piece C has two further pins, one attached to each end. These pins pass through holes in the corresponding ends of the crescent D, as illustrated. The pin ends under some circumstances also project through the walls of the wheel nut, suitable holes being provided. Small compression springs E and F surrounding the two pins mentioned, normally pressing asunder the two crescent pieces, and in so doing force both the pawls into engagement with the hub ratchet wheel, thus effecting a duplicate and positive lock. Two notches G on the circumference of the nut are suited to engage projections on the wheel nut spanner.

The operation of wheel detaching is in this wise: The special spanner provided is arranged so that in forcing it into position on the nut the pin Bl, which has a somewhat inclined end, is depressed, and hence the catch B is disengaged. The spanner meanwhile passes freely over the pin Al, but this pin is in its turn depressed by a small handle-operated cam attached to the spanner, so that the second locking pawl A is thrown out of engagement. The act of depressing the pin

A1 through the medium of the crescent piece C also operates upon the pins E and F, thrusting them through the skin of the nut, as indicated in dotted lines, Fig. 11. In this position the pins prevent the removal of the spanner and the wheel loosening process is proceeded with, the action being quite similar to that of those types of wheels already described. In attaching the wheel the above action takes place in reverse order, when, however, it is considered to be sufficiently secure upon its hub the small cam lever on the spanner is released, and if the positions of the parts are suitable the pawl will fly into engagement and release the spanner by withdrawing the pins E and F; otherwise a little extra pressure upon the spanner will be necessary. On removal of the spanner the automatic catch pawl B flies into position, and the necessary double lock is secured. Interest lies in the fact that no loss of memory can interfere with the proper handling of this wheel, for the spanner cannot be removed until the first catch has been released by a turn of the small cam handle, and the secondary catch is quite automatic in its action and is synchronous with the removal of the spanner. The word foolproof appears to be singularly applicable to this ingenious locking device, and if it is not stamped on it is surely only because such a proceeding might be likely to interfere with the commercial prospects of the wheel.

The Jackson Wheel

A wheel of somewhat different construction from those already described is the Jackson. It has a few features that are quite worth attention. Fig. 12 shows this device partly in section. The permanent hub A has at its inner end a coned portion B and a flange C, which contains the driving pegs D. The wheelnut E has a coned extension which fits into a corresponding conical mouth of the wheel hub G. Thus when the nut is hard up, the hub

takes its bearing upon twin conical surfaces, one at either end, and is in this way accurately centered upon its axis. Immediately upon removal of the whole nut the wheel becomes quite loose, as the cones are not such as upon which the hub can jam, and the wheel can consequently be removed. The peculiarity of this method of attachment is that the conical extension of the nut is cut through at El in half a dozen or more places. As the cuts extend back to the grooved portion, each segment has a certain amount of elasticity, such that when the nut is screwed hard into the coned part of the hub the segments firmly grip the thread and form an efficient locking device, which should be proof against vibration.

The demountable wheel is not generally considered safe with reliance upon one lock only, so that an additional lock is now suggested. This lock is not illustrated. The permanent hub has near its outer end a series of holes drilled radially and the wheelnut has as well a series of holes, though in this case they are a little elongated, so as to allow for slightly varying positions of the nut axially on its thread. A locking pin with a special spring attachment to retain it in position is passed through one or other of these holes, thus forming a secondary lock.

All the wheels, so far described, have as part of their locking arrangement a ratchet wheel, and as a rule a couple of pawls—one automatic in action and the other to be operated by a small lever.

The Sankey Wheel

The Sankey wheel, however, with reference to which a few remarks must now be made, differs in that it has a single automatic pawl only, which is locked securely by a small external finger-operated lever in a manner now to be described. Fig. 13 shows on the left a section of the locking device and on the right an external view. The pawl A nor-

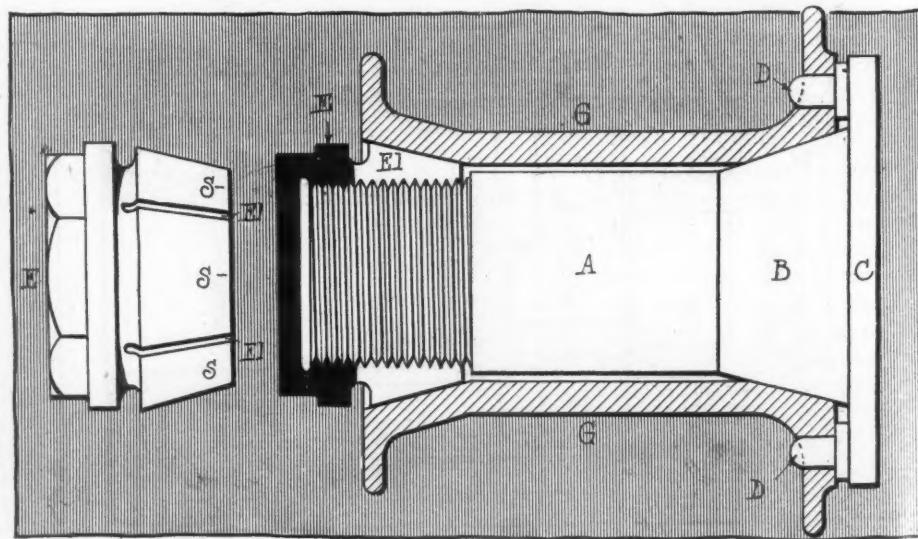


FIG. 12—THE JACKSON DEMOUNTABLE WHEEL

On the Jackson wheel the permanent hub A has a coned inner end B with a flange C, in which are the driving pins D, which engage with a flange on the demountable hub G. A simple wheel nut E is used to hold the wheel on. This nut is shown in place and also removed to show the slots El and segments S

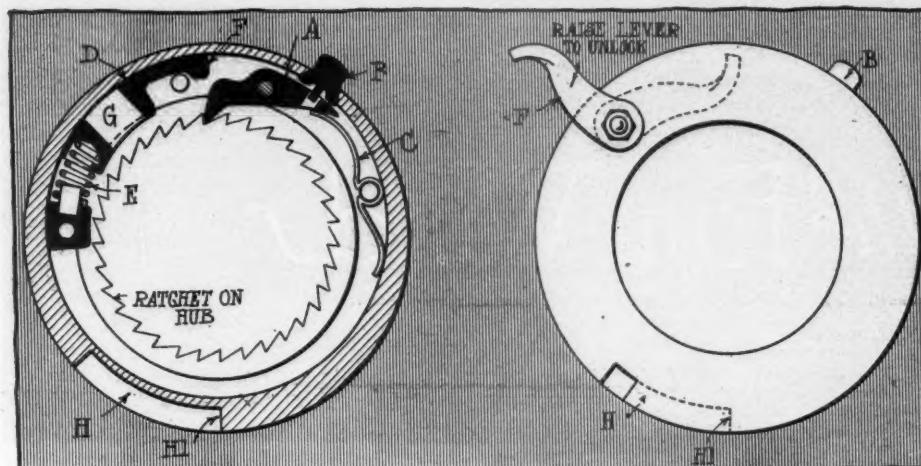


FIG. 13—LOCKING DEVICE ON THE SANKEY DEMOUNTABLE WHEEL

On the left is a section of the locking device used and on the right is an external view of it. This is a pawl-and-ratchet device with a special locking device used. This wheel is driven by five tapered plugs on the demountable hub—which engage with corresponding holes in the permanent hub. A wood artillery type of wheel is used.

mally engages with the teeth of a ratchet machined upon the hub. The pawl can be operated exteriorly by means of the button B, the spring C maintaining the pawl in engagement with the ratchet teeth as well as in contact with the button. The locking device consists of a sliding bolt D and a spring E to retain the bolt in position. This circumferentially sliding bolt is operated by a small cam, which is attached to the lever F and which engages in the slot G. On the right-hand side of the sliding bolt D is a projection or nose F. This nose, as shown in the illustration, is clear of the pawl, and hence the latter may be lifted out of engagement, but when the small external lever is moved to the dotted position the bolt slides to the right, and the nose of the bolt coming into a position over the pawl effectively locks it.

The action of these parts will be made clearer if the function of unscrewing the nut for removal be described. In the first case a special spanner, as is usual, is necessary. This spanner has a small internal projection situated in its opening and opposing it an inclined notch. When the spanner is fitted onto the nut, the projection engages in the circumferential slot H, and the deepest part of the inclined notch of the spanner passes over the button B. As the spanner is turned from right to left to unscrew, the small projection slides along the slot to the position H1, and meanwhile the button has been depressed by the movement of the inclined notch. The first few degrees of movement of the spanner therefore serve to disengage the pawl only, subsequent movements of course unscrewing the nut. It should have been stated that immediately after attaching the spanner it is necessary to swing the locking lever over to the left; this action withdraws the pawl locking bolt and assists in holding the spanner in position upon its nut. It will be noticed that in tightening the nut the spanner cannot be removed until the locking lever has first of all been swung

clear—see dotted position in the right-hand view—which means actually that the spanner cannot be removed from the nut until the latter has been doubly locked—in the first case by the pawl and in the second by the pawl-locking bolt.

The method of drive employed in the case of the Sankey wheel consists of five tapered pegs upon the wheel hub, which engage with the same number of holes in a flange upon the permanent hub. This driving system appears to be a very excellent one, especially when accompanied, as in this case, by a double-cone centering arrangement. It should be mentioned in passing that the Sankey wheel is composed of pressed steel and is of very great strength; its appearance, if it be not examined too closely, is that of a wood wheel of the usual artillery type.

FRICTION AND LUBRICATION

A question that is still a matter of debate in motor car practice is the proper lubrication of the motor. A discussion of the subject in a series of articles by Robert W. A. Brewster, which recently appeared in the Autocar, published in London, may serve to help clear up some phases of the question.

The author finds that the failure of any lubricating system with its consequent results of seized or heated bearings is generally due to one of the following causes:

Insufficient supply of the lubricant due, in a force system, either to the choking up of an oil way or the failure of the oil stream to reach those bearings which are farthest from the pump. This failure may be due to a too free means of efflux of the oil from those bearings which are nearest to the pump and usually at points where the pressure in the oil line is the greatest.

Unsuitably placed admission devices for the oil supply, as for instance the oil holes entering the bearings at points of high pressure or oil grooves cut in such position that they do not distribute the oil properly over the lower surface of the bearing itself. There is a considerable diversity of opinion as to the best condition and shape of oil grooves

upon a bearing and as the oil generally enters the bearing at some point near its center these grooves should be so arranged that the oil is distributed where the pressure is low. Preferably such grooves should be so cut that the oil is distributed over a portion of the circumference as well, so that as a point of minimum pressure moves around the bearing under the variation of working conditions adequate oil supply can be secured at the point of minimum pressure. This can be assured by connecting the transverse grooves on the bearing by a staggard groove passing around it. When forced lubrication is employed the oil grooves are more simple than when a purely splash system is relied upon, and in addition a higher load can be carried by a bearing on a force lubrication than on the other system.

The overloading of the bearing is one of the causes of failure and depends upon several factors, the chief of which are the length of duration of the pressure, the facilities for cooling, the method of oil supply and the nature of the lubricant.

A change in the nature of the oil itself or a reduction of its viscosity, caused either by excessive heating or inherent defects in the oil, is direct cause of the failure of the lubricating system. This can only be guarded against by care in the choice of the oil, but the viscosity of the lubricant when it is sold is not by any means an indication of the same property when the oil is heated up to working temperature.

The nature of the lubricant for any particular purpose depends upon the physical conditions to which it is subjected and lubricants are usually tested in the following ways: By chemical analysis; for specific gravity; for relative viscosity; for gumming action or quick oxidation; for flashing and burning points in a testing machine. In regard to viscosity the method of testing generally adopted is the observation of the time taken for oil of a measured quantity to drop from the end of a fine tube.

A study of the results of such test on a variety of oils under various temperatures revealed the fact that oils which are very viscous rapidly lose their viscosity when heated to 212 degrees fahrenheit, which is, however, a higher temperature than should obtain in the base of an engine. Many engines work at temperatures in the neighborhood of 180 to 200 degrees fahrenheit, while others sometimes reach the boiling point of water.

It is seen then that the oiling arrangements of a motor car should be such, and the pipes and passages of sufficient diameter as to allow a viscous oil to pass when both the engine and oil are cold. If a force feed lubrication system is used it will be seen that when the engine is heated up an enormously greater quantity of oil will travel through the same sized pipes, and at the same time a hot oil will much more easily squeeze out between two surfaces in contact than will the same oil under lower temperature. It is these factors that determine the efficiency of any lubricating system.

From the Four Winds

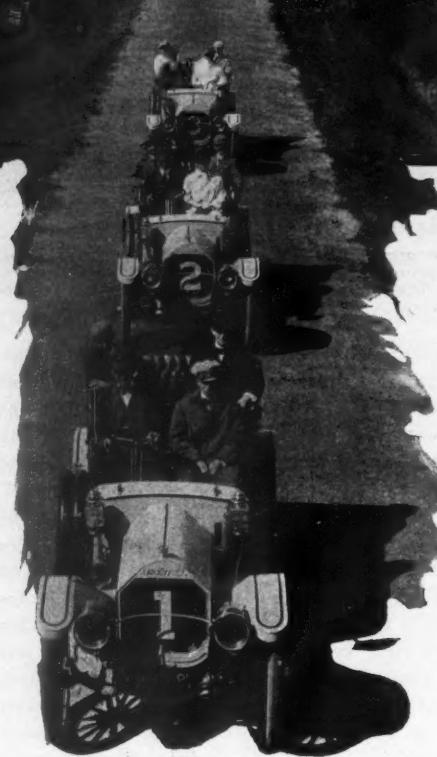
CLUB Paper for Hartford—The Automobile Club of Hartford, Hartford, Conn., has undertaken the publication of a monthly magazine to be known as the Bulletin. The magazine will make its appearance next month and will be published each month thereafter.

Improving Transcontinental Route—The wooden bridges and culverts along the Omaha-Denver transcontinental route are being replaced by concrete bridges and culverts. A great deal of work is now being done toward the grading and placing of the roadway in better condition.

Where Signs Are Needed—There is one man in California who is a strong advocate of a thorough system of road signs, and in the last few days his belief has been very greatly strengthened. Max Hoens, a theatrical man of Fresno, on a 3,500-mile tour of California, started from Stockton to drive to Modesto, a distance of about 50 miles. After a hard drive of some 3 hours he found himself back in Stockton. Now he is anxiously awaiting the advent of the Goodrich or Diamond sign-posting trucks.

Suing for Tag Money—The state highway commissioner of Oklahoma is preparing 3,000 suits to be brought against that number of car owners who have not paid the state tax of \$1. The tax lists record 4,125 owners of cars in the state, 1,583 of which have paid the small tax required to maintain the state highway bureau. Repeated efforts have been made to obtain the tax but the only course open to the state highway commissioner is to bring suit in all the counties where the motor car owners reside.

Wilby Reaches the Coast—One of the most successful transcontinental motor trips ever made from the Atlantic to the Pacific coast has just been completed by Thomas W. Wilby, under the auspices of the Touring Club of America. Mr. Wilby left New York on August 31 last, and completed the first stage of his journey last week, when he reached San Francisco in about 35 days. Besides mapping out the most feasible route for every mile of the journey and compiling the latest information regarding road conditions in every state through which he passed,



MAXWELL GLIDDEN TEAM
No. 1, Harry Walls; No. 2, E. G. Gager; No.
3, Thomas Costello, representing Tarrytown,
N. Y., in national tour

another object of the tour is to show how comfortably a long distance journey across the country may be accomplished by motor car. Mr. Wilby averaged from 100 to 125 miles a day throughout the trip.

Wheel Tax at Kendallville—The city council of Kendallville, Ind., has passed a vehicle tax ordinance and all drivers of trucks, motor cars and other vehicles must now pay a fee into the city treasury. The revenue thus derived will be spent in the repair of the city streets. The fees range from \$1 to \$15.

Motorists Visit Center of Population—The Soldiers' and Sailors' monument in Indianapolis is just 52.3 miles from the center of population of the United States at Bloomington, Ind. Those are the figures shown on the speedometer of the six-cylinder Premier in which a party of Indianapolis motorists, driven by Ray McNamara, made the trip recently. The nose of the big machine pointed due south in Meridian street at the start and at the finish it was touching the signboard that designates the center of the United States populace, in front of the furniture factory of Showers Bros. The center of population has been the center of interest for the

past several months since the exact spot was located, following the population announcement of the United States census bureau for the decade ending with 1910.

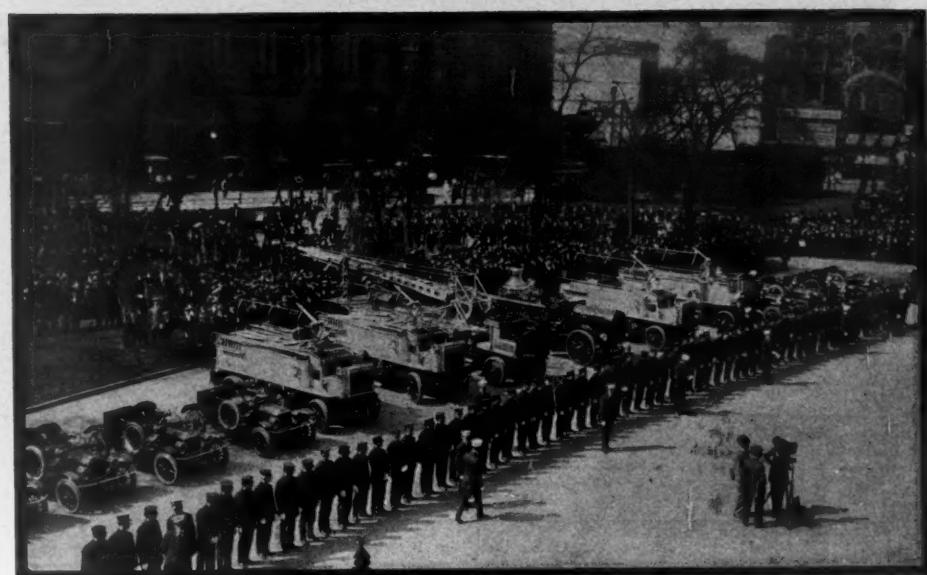
Minneapolis Sets Hill Date—The date for the hill-climb to be held under the auspices of the Minneapolis Motor Club has been definitely fixed for October 21, weather permitting. It will take place on the Columbia Heights hill.

Danbury Races Called Off—Owing to the slippery condition of the $\frac{1}{2}$ -mile track at Danbury, Conn., Secretary Schumacher of the contest board of the A. A. A., who was to have officiated at the meet, would not permit it to be started. This track is of a rather sharp elliptic shape and is the one on which de Palma met the only accident of his career 2 years ago. On that occasion he went through the fence at the same spot that two other drivers went through last year. The races, which were to be held in connection with the county fair, were called off altogether, although at first it was seriously considered to hold them on Monday.

Georgians Plan Tour—Final plans for the tour around Georgia have been made. According to present plans the tour will start November 22 and last 11 days. Only 6 days, however, will be spent on the road. The rest will be spent in Savannah, where the tourists will be on hand for both the grand prize and the Vanderbilt races. It was determined to make the tour a happy-go-lucky affair with no technical conditions and with no requirements upon any of the entrants except that they cover the route and check in on time. The exact list of prizes has not been announced but already \$3,200 has been subscribed for this purpose. The city of Savannah has made a special prize offer of \$600 to the town or city sending the greatest number of tourists in proportion to its population. The scheme is to start the tour from Atlanta November 22. The first day's run will be to Americus, 149 miles, with a stop at Zebulon for lunch. The next day the tourists will journey to Valdosta, covering 137 miles. There will be a stop at Albany and a lunch at Thomasville. The third day's touring will get the tourists to Baxley, 133 miles,

with a noon control at Waycross. Baxley is the smallest town that is honored with a stop and as there is no hotel that will accommodate the tourists they will be entertained by private families or in some public building. However, in this place supper and breakfast will be served free to the tourists. The exact route of the fourth day's run, which is to Savannah, will be the subject of further scouting. The route first proposed is 105 miles in length. In Savannah the tourists will have 5 days to view the two big races and to tour over Chatham county's excellent roads. After the running of the grand prize the tourists will take up their journey again. The first noon control out of Savannah will be Statesboro, and the night control Dublin, 125 miles. The following morning the tourists will run to Macon and that night will complete their journey in Atlanta, 152 miles for the day.

Record of Which to Be Proud—Medford, Ore., believes it has a record both for motor cars and for good roads activity. Statistics from Medford and the Rogue river valley show there are 400 cars in Medford and 700 in the Rogue river valley. One hundred new machines have gone into Medford during the last 2 years. These figures, which can be verified by license statistics at Salem, are believed to give Medford the distinction of having the greatest number of cars per capita of any community in the country. There is a car in that city for every twenty-five persons. The majority of the cars are in the \$2,000 class, although there are many cheaper cars and some forty or fifty in the \$5,000 and \$6,000 class. There is scarcely an orchardist in the valley without a car and some of them have three or four. With so many autoists it is natural that there should be great interest in good roads, though with the approaching election in Jackson for a bond of \$1,500,-



INSPECTING NEW YORK FIRE DEPARTMENT

Mayor Gaynor last week formally review the motor fleet used by the metropolitan department, which made a great impression on New Yorkers

000 for the construction of permanent highways, the interest is not confined to motorists by any means.

South Bend Asks Bids—One of the first steps taken by the city of South Bend, Ind., to install motor vehicles in all the fire stations during the next few years has been taken by the city council appropriating \$6,500 with which to purchase a motor chemical engine.

More Routes Planned—At the meeting of the good roads committee of the Northern Minnesota Development Association at Cambridge, Minn., last week, when representatives of the interested counties came together, the road from International Falls to the Twin Cities was laid out on paper, with only 9 miles to build, and the tentative choice of a route from Duluth to St. Paul, to be tapped for Minneapolis beyond New Brighton. At the Cambridge

meeting an advance stand was taken for the use of prison labor in crushing rock material for good roads.

Track Meet at Sioux City—The Sioux City Automobile Club announces a sanctioned track meet to be held on the Woodland park track October 20-21.

Grand Rapids Has 1,399 Cars—The bulletin of cars licensed in Michigan in August, just issued by the secretary of state, shows more than 1,399 motor cars owned and operated in Grand Rapids.

Atlanta's Motorists Make Plans—The Atlanta Automobile and Accessory Association decided to motor to Macon, Ga., October 11 to take part in the governor day celebration there. Plans have been discussed for the holding of races on the Atlanta speedway the day the Glidden tourists are in Atlanta, October 23, but nothing definite has been done. Anent the Glidden, Atlanta entrants made a strong effort to get the start of that event postponed a day in order that the people who take part might see one day of the world, a baseball championship series. Many telegrams were sent asking for the postponement, but this was refused by the promoters of the tour.

Philadelphia Club Prospering—A meeting of the board of governors of the Automobile Club of Philadelphia was held last week, at which twenty-five new names were added to the membership roll and general plans for the proposed new garage and clubhouse discussed. It is announced that work on the latter will be started before the snow flies. The club issues annually a route book to its members, this year's number containing 368 pages, and being rich in touring information, including a digest of the laws of eighteen nearby states, an index map of Pennsylvania, twenty-eight pages of town maps and routes that take in points from New England to Virginia and as far west as Ohio.



CENTER OF POPULATION

Ray McNamara in a Premier recently drove from Indianapolis to Bloomington, Ind., which, the census bureau declares, is the center of population of the United States

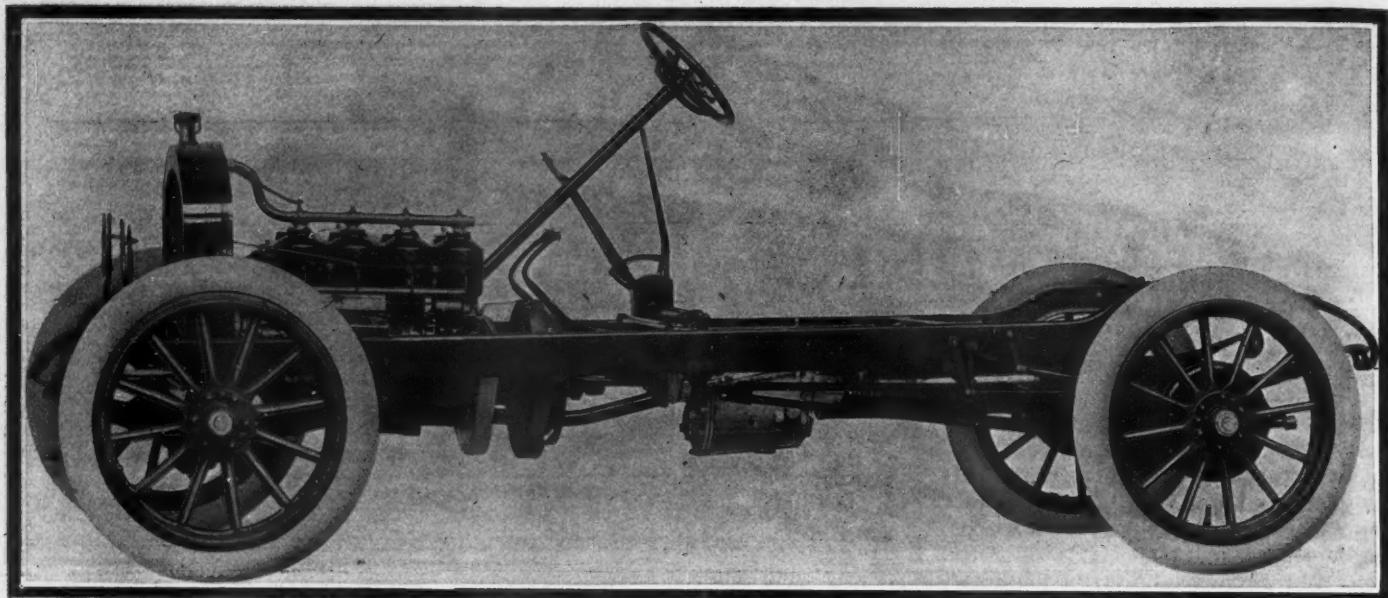


FIG. 1—THE 1912 RAMBLER CHASSIS

This is the chassis fitted with the 4½-inch square motor, in which the cylinders are cast separately as formed with valve pocket on the right side for both valves. The chassis improvement in the form of two V-shaped torsion rods is shown. This chassis is characterized by the use of dropped frame side members and three-quarter elliptic rear springs.

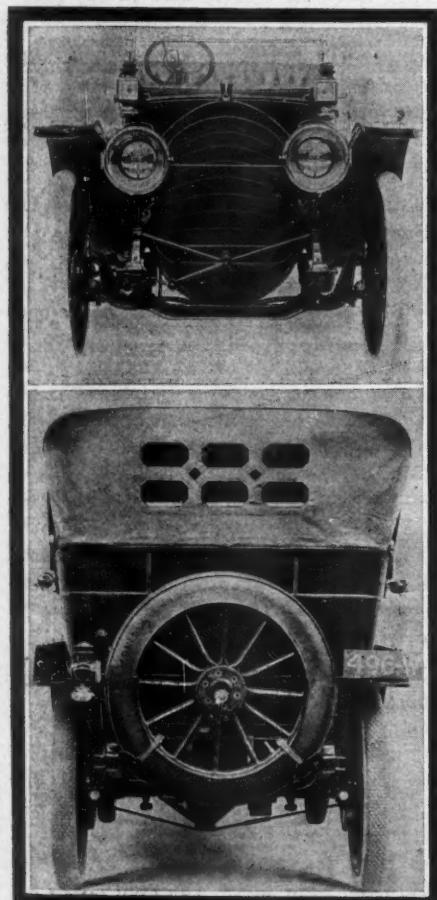


FIG. 2—RAMBLER IMPROVEMENTS

The upper illustration shows the new Rambler radiator. It is higher than this year, the upper corners are more rounded and the sides have a different slope. The lower illustration shows how the spare wheel may be carried in rear, but provisions are made for carrying it on the right side of the car.

Many Rambler Car Types

HERE have been many detailed changes by way of refinements made in the 1912 Rambler line. The refinements have not all been confined to the chassis, the body and its equipment have profited as well. The 1912 line is built on three chassis sizes, all of which are alike in general points of construction but different in motor sizes, wheelbase, wheel sizes, springs, etc. On these three chassis but two motor sizes are used, namely, 4½-inch square motor, and the larger one with 5 by 5½.

Fig. 3 is an illustration of the smaller motor chassis and from it many of the changes made can be noted. One of the most important is a rearrangement of the motor appurtenances, so that now the waterpump, lubricator and magneto are located on the left side and indicated respectively 1, 2 and 3. The water pump is now in rear of the cross piece forming the front motor support, and the magneto and lubricator have changed positions, the magneto being at the rear which offers a convenience in supporting the wiring outfit. On the right side are the intake and exhaust manifolds. At 4 is shown an improvement in that the fan is driven by a leather belt from a pulley on the end of the pumpshaft, whereas heretofore it was driven from a pulley on the crankshaft.

The use of a four-cylinder motor is continued in all models; the cylinders are separate castings of L type with the valves placed on the right side. The offset given the crankshaft is continued and the entire motor is mounted at a slight rearward slope, to give a straightline drive to the rear axle. The lubricating system has been improved in that the oiler is now a seven-feed type with four oil tubes leading to the four cylinders and with the remaining three to the crankshaft bearings. A splash is maintained within the

crankcase. On the small motor a single magneto system is used with the Bosch instrument as the current generator. One set of spark plugs is located over the intake valves and the swinging lever connections has been discontinued, the high-tension cables connecting by standard terminal to the spark plug.

In a passing resume of this chassis a few changes can be noted, one of which is the employment of what is known as three-quarter elliptic rear springs instead of the seven-eighth type in use this year. Those familiar with Rambler construction will remember that this year the upper part of the rear spring is continued forward and attaches by eye bolt to the frame at a point midway between the axle and the front end of the lower leaf of the spring. Heavy gusset plates are now used at the rear corners of the frame for the attachment of these springs.

Few Changes Noted

There has not been any change made in the expanding clutch; the three-speed selective gearset remains as at present and the semi-floating design of rear axle has not been altered. As Fig. 3 illustrates, the gearset is a unit with the rear axle due to the rigid connection between them by the propeller shaft tube T. An improvement not been altered. As Fig. 3 illustrates, the torsion rods R, one on each side of the propeller shaft tube, which rods are now made in V form, the spreading arms attaching to vertical arms on the rear axle housing. During the present season these torsion arms have been single arm pieces.

This chassis is used for three body types which have been designated the Roadster, Suburban and Cross Country. The roadster is a two-passenger design; the suburban a four-passenger torpedo, and the cross country a five-passenger touring car.

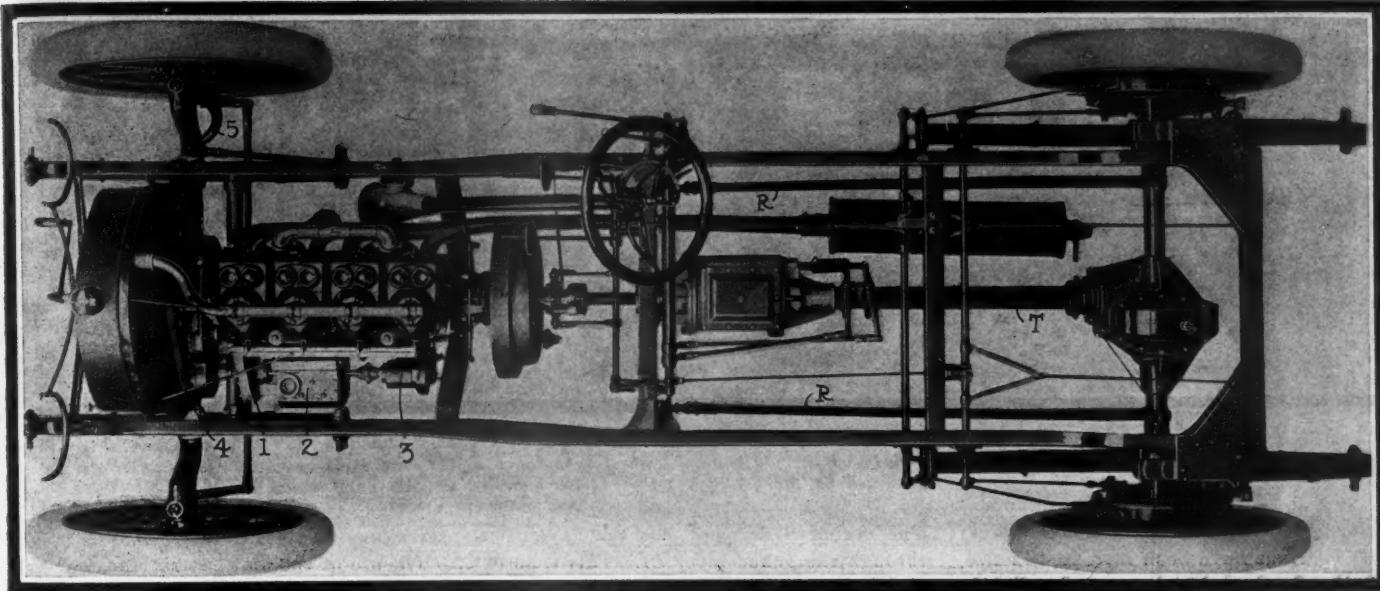


FIG. 3—RAMBLER CHASSIS, 4 1/4-INCH SQUARE MOTOR, SHOWING IMPROVEMENTS
Pump, oiler and magneto are shown at 1, 2 and 3

New Designs

All of these are mounted on the standard 120-inch wheelbase chassis, fitted with 36 by 4-inch tires. The front axle used is an I-beam forging instead of a tubular type of previous seasons, and the tie rod is placed in rear of the axle with the steering arm 5, Fig. 3, carried above the axle instead of beneath it, which removes this important part from the danger zone. All three of these bodies are of the fore-door type and use the cowl dash which has been made standard on all types for the coming season. Right-hand control is used, with levers mounted inside of the body.

The Larger Chassis

The large Rambler chassis, using the 5 by 5 1/2-inch motor, is not illustrated, nor is the motor employed illustrated. Its general design is the same as that of the smaller chassis. It is, however, made in two wheelbase lengths, one of 120 inches, and the other 128 inches. The 120-inch wheelbase takes three bodies, known as Moraine, seven-passenger touring; Valkyrie, four-passenger touring; and Country Club, five-passenger touring. On the 128-inch wheelbase chassis are two open bodies, the Metropolitan, a seven-passenger torpedo, and the Greyhound, a six-passenger torpedo.

The horsepower of this motor has been increased without adding to the cylinder dimensions, which has been accomplished by increasing the valve lift and using what is known as the Rambler ejector exhaust manifold. This is a four-tube type of manifold, these tubes uniting in a common expansion pipe which is led rearward to the muffler. The general improvements on this larger motor are the same on the smaller one, but the ignition is different, being a Bosch dual outfit. All wiring is now encased in brass tubes, and the lever connections with the spark plugs have been eliminated as in the smaller model. The

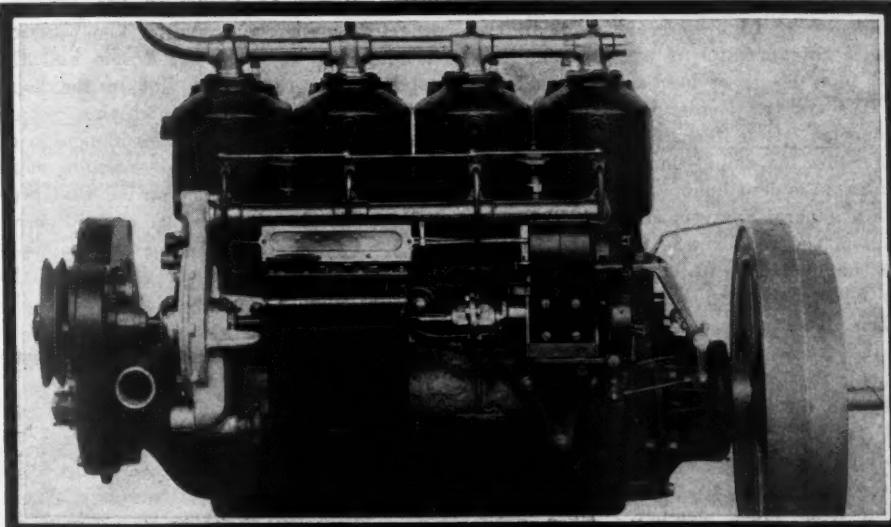


FIG. 4—RAMBLER 4 1/4-INCH SQUARE MOTOR

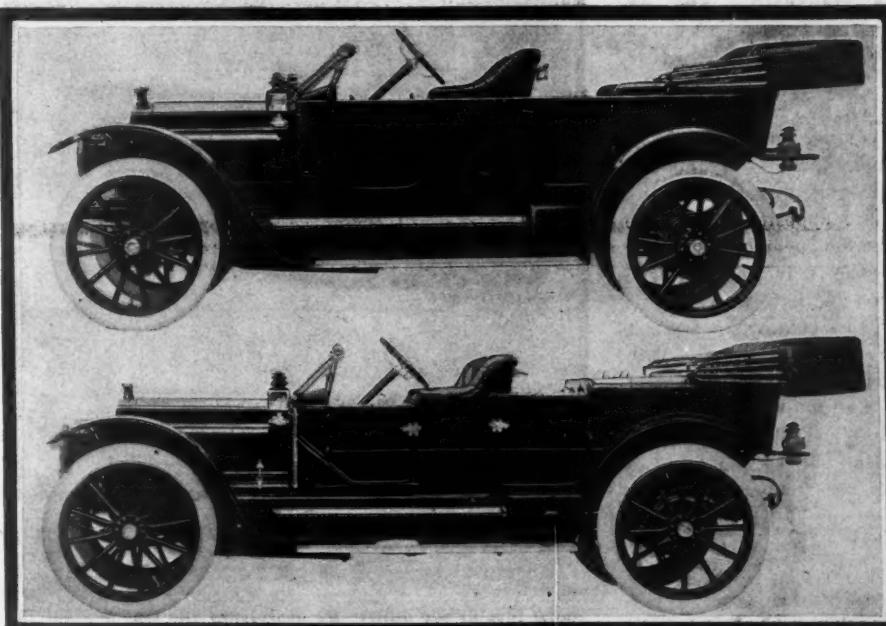


FIG. 5—RAMBLER TYPES, CROSS COUNTRY AND MORAINES UNDERNEATH

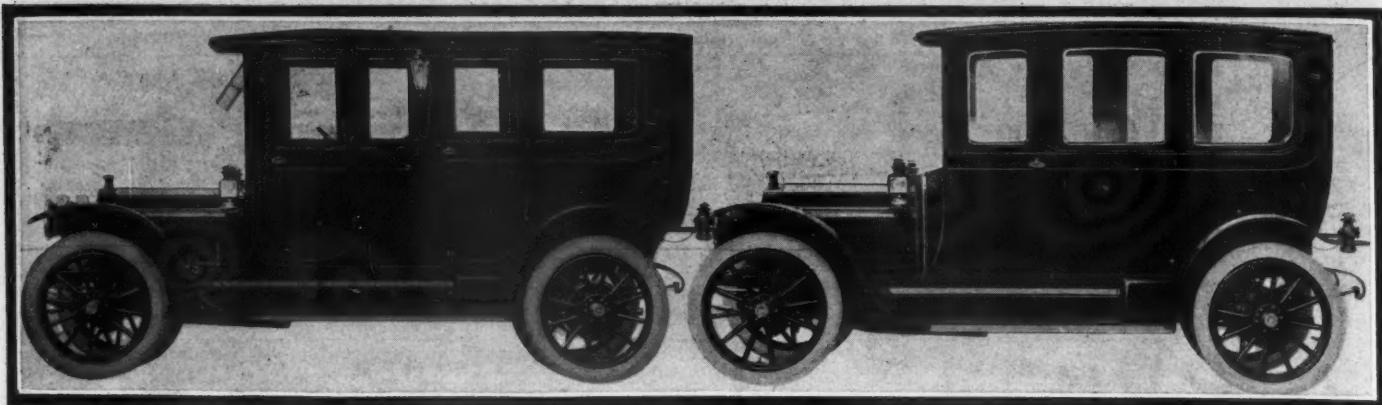


FIG. 6—TWO ENCLOSED TYPES OF RAMBLERS FOR 1912 SEASON

At the left is the Knickerbocker, a seven-passenger body on the big chassis with 5 by 5.5-inch motor. At the right is the four-passenger coupe, mounted on the 4.5 inch square motor chassis.

timing gears are larger; all the crank-shaft bearings have been increased in size, and the flywheel has been made slightly lighter.

As in the smaller model a new design of radiator has been used, which is somewhat higher than that of 1911 with more rounded top and a different slope to the sides. This radiator is of the same vertical tube design as used on this make of car for several years, and is a factory production. It is illustrated in Fig. 2. On this model the employment of the tubular front axle is continued.

In a general analysis of the 1912 Rambler line, the reader who has been following the evolution of this chassis cannot but be struck with the fixity of design which has characterized it and which is continued.

Among these can be noted the use of a horizontal tube forming the forward motor support, and resting the rear end of the motor on a drop cross member. This eliminates the necessity of integral arms on the crankcase. The expanding type of clutch is continued and is illustrated in Fig. 7. In this clutch the fabric facing F is carried on a steel band which anchors at one end to the fixed member W and at the opposite end to the movable member N. It is by the movement of the piece N that the fabric is forced outwards against the flywheel drum. This expansion is accomplished by a slight rotation of the radial rod R, which when rotated moves the arm A. This arm connects through a linkage L with ball-and-socket joints at B to the piece N, so thrusting the piece N away from it for expansion, and drawing it towards it for contraction.

The spring S accomplishes the expansion through the yoked lever S1. This type of clutch has been used several seasons by the company.

One other Rambler feature that has been continued is the tilting steering column, which allows of adjusting the steering wheel to suit the driver. The steering housing is hinged to the frame and the column rises through a slot in the floor. A metal plate, through which this column passes, covers this slot. The underside of the slot is serrated, which serrations mesh with others on the floor boards. Clamping bolts holds the plate in any desired serrations. By loosening these bolts the plate may be moved forward or aft, giving the steering column the required tilt, and the

serrations maintain the desired angle.

The use of the unit gearset and rear axle has been a Rambler feature for several seasons. It eliminates the necessity of universal joints in the propeller shaft. The one universal of this system being at the forward end of the gearset and in axial alignment with the ball-and-socket support for the gearbox.

SWITZERLAND'S MOTOR CENSUS

According to recent statistics, there are 2,276 pleasure cars and 326 commercial vehicles in actual operation in little Switzerland, or a total of 2,602. Of this number 1,454 are of foreign construction and 1,148 are made in Switzerland. Of the Swiss cars there are 299 Martins, of which

284 are pleasure cars, ninety-seven Orion commercial vehicles, thirty-eight Saurer and thirty-eight Arbenz industrial cars. Of the 2,276 pleasure vehicles there are 1,030 of 11 to 30 horsepower; 605 of them 6 to 10 horsepower; 315 of from 21 to 30 horsepower; 157 of 5 horsepower or less; 108 of 31 to 40 horsepower; forty-eight of more than 40 horsepower, and thirteen of unknown horsepower. Among the 326 commercial vehicles 138 have 11 to 20 horsepower, 101 have 21 to 30 horsepower, fifty-five have from 6 to 10 horsepower, eighteen have from 31 to 40 horsepower, eight have up to 5 horsepower, four more than 5.

Owing to the unfriendly attitude of the people in various parts of the country the home industry is not progressing as well as desired. So many restrictions have been placed upon motorists in some sections that none passes through the country.

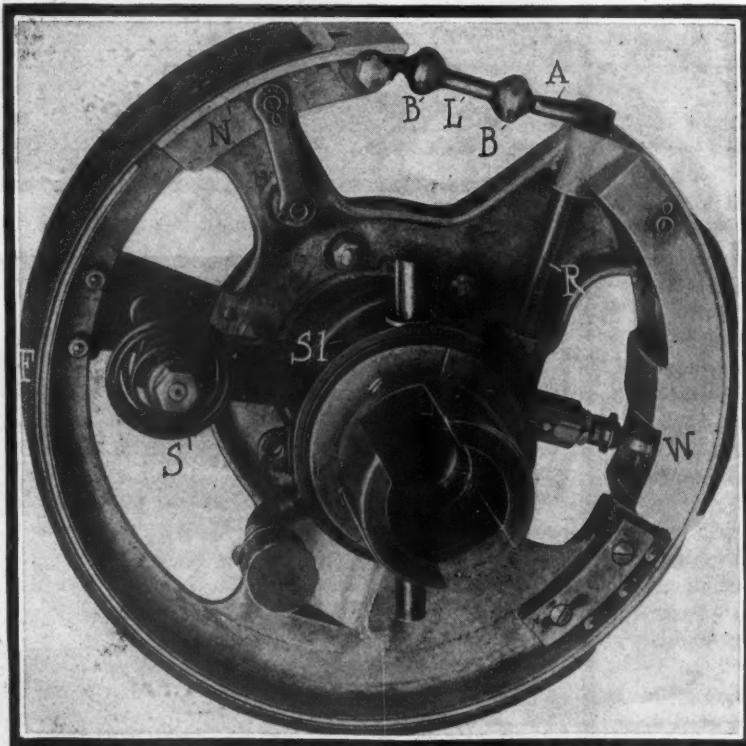


FIG. 7—RAMBLER EXPANDING CLUTCH

In this clutch the external band is expanded by the link L, which connects through ball-and-socket joints B, with the arm A at one end and the clutch face at the other. By depressing the clutch pedal the rod R is given a part rotation, which contracts the clutch. The spring S acting through the rod R expands it.

Handling the Second-Hand Car Problem

DIFFERENT dealers have different methods of handling the second-hand proposition, but it is pretty generally agreed that as a money-maker this department of the business cannot be counted upon to show a profit. Indeed, if a concern can get an even break at the end of a season there is ground for congratulation. As generally constituted, the second-hand car business simply is an auxiliary which has become a necessity in order to move new cars, and the aim of the dealer is to get from under as easily as possible. In most cases he actually loses money in a second-hand car deal, but when coupled with the sale of a new machine a profit shows—not so much generally as would be the case if the new car were sold outright, but still enough to satisfy him because he figures that if he didn't

take the old car in trade he would not sell the new one. Most dealers, when they take an old car in are satisfied to move it without profit, and because of this there are many real bargains to be found. For instance, an agent will take an old car in at \$500 and he will spend \$50 more to tune it up. Perhaps the car really is worth \$800, but the dealer does not try to get that; he is willing to sell it at \$550, providing, of course, the car is part of a deal on a new model. It also is remarked that the owner really can get a better price for his old car than the dealer, for the public seems to be suspicious of the tradesmen, whereas with the owner the excuse that he is getting a higher priced model or is going out of the city seems to go with the buying public.

Chicago dealers have given the matter of the second-hand car considerable thought and each has some particular scheme in connection with this department. Some pay little heed to the cost of turning over an old car, while others keep close tab on every expenditure and at the end of the season can tote up just how much the department has cost; if it has shown a loss or a profit and other interesting facts. Louis Geyler, representative of the Hudson, is in the latter class, and he has devised a tabulation which keeps the figures at his finger's ends. A filing system is established, the card which contains the history of the deal being an interesting document, as is shown by the accompanying illustration.

Name _____	Address _____
Model _____	Date Del'd _____
Car No. _____	Salesman _____
No. Sold _____	No. Sold _____
COST	SELLING PRICE
Car Equipment Top: Glass Front Speedometer — Tire Irons Bumper Freight — Extras Storage Cutout	Car Equipment: Top Glass Front Speedometer Tire Irons Bumper Freight Extras
1281.00 14.75 15.19 8.00 7.56	Cash 800.00
Commission — Second-Hand Car Overhauling: Parts Labor Painting Extras	Second-Hand Car — Hudson Equipment: 1500.00
43.80 12.00 8.00 1324.80	Rock 1394.80
	Profit 175.20
	Cost of Sale 43.80
	Balance Profit 175.20

**CARD HISTORY OF SALE OF NEW CAR ON WHICH OLD ONE HAS BEEN
ACCEPTED AS PART PAYMENT**

On this card is entered the list price of the new car that is the basis of the deal, along with notes as to the extra equipment furnished. Charged also is the work that is done on the old car that is taken in trade. This is under "cost." In the other column, "selling price," the amount of cash paid is noted, the price allowed on the old car is credited, then the cost is subtracted, which shows the profit on the deal. At any time Mr. Geyler can turn to his index case and find out just how each particular sale has figured out.

In this particular case John Smith bought a new car for \$1,221; he had fitted a speedometer which cost \$14.25, while also charged up is the matter of freight, \$15.19, and a cut-out, \$2.56. The card also shows an item of \$8 for storage, which, however, the customer does not pay. That is there because the dealer had the car in a storage warehouse for 2 months in order to keep up his stock, so of course this item necessarily must enter into the calculation and be charged off against the profit. The next item shows the commission that was paid the salesman, \$43.80, and the next the work that was done on the old car to make it saleable. Mr. Smith had paid \$800 in cash and had been allowed \$700 in trade on his old car, bringing the total up to \$1,500. The dealer paid \$1,221 for the car; it cost him \$45.75 for extra equipment and labor on the old car and the salesman's commission, bringing his cost up to \$1,324.80, and making his profit on the deal \$175.20. This, however, is not

as big a profit as would have shown had not the old car figured in the deal, so while the dealer made money he also lost it, for if it had been a cash transaction on the one new car he would have cleared \$204.80 and made \$29.60 more.

In this deal it will be noted that the salesman is credited only with a commission on the sale of the new car. Mr. Geyler's system does not include the second-hand car in the deal. If the man who sells the new car also disposed of the old one he gets nothing for his work, but if another salesman markets the old machine then the first man has to pay the latter a commission of 4 per cent on the selling price of the veteran, which in this case would be \$28. Therefore, there is an incentive for the original salesman to also get rid of the car he has taken in trade.

In the case of second-hand cars the Hudson agent, while not giving a guarantee on old Hudson cars, still tries to live up to the spirit of that guarantee and goes out of his way to keep the purchaser of the old car satisfied. With cars of other makes he, of course, does not pretend to guarantee them.

The main idea with Mr. Geyler is to sell new cars rather than make a profit on the old one. The price he puts on the latter is what he allows the customer, plus what it costs him to make it marketable. The salesman does not set the price to be allowed on the old car; that is a matter settled by the head of the house. In setting the price he figures on a 50 per cent depreciation on 1911 models and an additional depreciation of 10 per cent on 1910 and 1909. Farther back than that he does not go, the line being drawn at 1909. It has been discovered that buyers nowadays do not look so much at the vintage of the car as they do its condition, which accounts for the comparatively small depreciation on 2-year-old cars in comparison with 1911 models. Cars older than that have to be disposed of by their owners, but this does not mean necessarily that the old ones which have been Oslerized by the dealer are candidates for the scrap pile. It has been demonstrated more than once that a car always is saleable provided the price is right, and that no matter how old it is it generally can bring at least \$200, there always being someone looking for a bargain.



NEW ESTABLISHMENT OF FERNALD AUTOMOBILE CO. OF DENVER, HANDLING THE MAXWELL

GEORGE COLLISTER Dead—George Collister, of Collister & Sayle, Cleveland, O., a veteran in the motor car industry, died October 3 of Bright's disease, complicated by heart trouble.

R. P. Henderson at New Desk—R. P. Henderson, vice-president of the Henderson Motor Sales Co. and brother of Charles P. Henderson, general manager of the sales company, is now at the desk of activity in the Henderson family. R. P. Henderson takes over a portion of the office work that had fallen on C. P. Henderson's shoulders.

Rajah Starts Plug Suit—The Rajah Auto Supply Co. recently brought suit in the federal court in Indianapolis against George F. Kreitlein, operating under the name of the Guarantee Tire and Rubber Co. and the Dealers' Auto Supply Co., alleging Kreitlein was manufacturing and selling a spark plug infringing on patents covering the Rajah plug. Kreitlein has filed an answer denying the allegation and stating that no fewer than eleven brands of spark plugs are on the market which are similar to the type manufactured by the Rajah company.

Additions to Olds Plant—Surveyors are now on the ground planning an addition to the Lansing factories of the Olds Motor Works, which will increase by about 50 per cent its present manufacturing facilities. The building contemplated is to have three stories and basement. It is to be 758 feet long by 74 feet in width and is to be an assembling area. Material, such as machined parts, assembled frames and complete motors, will be delivered to this building from the main machine shops and will pass through in the various stages of assembly from one end to the other

where they will emerge as a completed product. Special attention will be given to final inspection and a ½-mile plank track, built some time ago, will be utilized for final tests of finished cars.

Schacht Plant in Canada—The Schacht Motor Co., of Cincinnati, O., has purchased the plant of the Tilden-Jackson Typewriter Co., Hamilton, Ont., and has organized a Canadian company to manufacture commercial motor vehicles in Canada. The officers of the company are: President, Thomas P. Rolph, Toronto; vice-president, T. H. Schacht, Cincinnati; treasurer, Gerard Muntz, Toronto; secretary and sales manager, J. S. Innes, Toronto.

New Davenport Garage—The Buck Motor Car Co., agent for the Packard cars, Packard truck and Detroit electrics in Davenport, has moved into its new \$13,000 garage. The company is composed of J. W. Buck and his son Emil. The new Packard and Detroit electric headquarters in Davenport are 45 by 140 feet in dimension, constructed of terra cotta and concrete with brick front, with offices furnished in oak and a showroom with a capacity of ten cars. The building is equipped with elevator, steam plant and paint shop.

Show Building for Minneapolis—A show coliseum for Minneapolis which is to be completed by next January in time for the motor car exhibition was assured last week when the board of tax levy appropriated \$25,000 for an annex to the National Guard armory in that city. When completed the entire building will hold more than 9,000 people, and will have a floor space of 72,000 square feet. With the aid of the Minneapolis Automobile Show Association, the Minnesota National Guard has the promise of an additional

\$25,000, making a total of \$50,000, for the new building. Of this amount the Minneapolis Automobile Show Association, which really launched the movement for the improvement, has given \$10,000. The remaining \$15,000 has been practically promised by business men.

Join Trade Credit Body—The following concerns were recently elected to membership in the Automobile Trade Credit Association: Armiger Chemical Co., Chicago; Bliven & Carrington, Inc., New York; Calmon Asbestos and Rubber Works, New York; Federal Rubber Mfg. Co., Cudahy, Wis.; Fenstermacher Co., Minneapolis, Minn.; Gulf Refining Co., Pittsburgh, Pa.; Interstate Auto & Supply Co., Sioux City, Ia.; Lowe Motor Supplies Co., New York; Lutz-Lockwood Mfg. Co., Roselle, N. J.; Marvel Carburetor Co., Indianapolis, Ind.; William P. Miller's Sons, Long Island City, N. Y.; Piel Co., Long Island City, N. Y.; Union Auto Specialties Co., Pittsburgh, Pa.

Ignition Business Sold—The Never-Miss Mfg. Co., of Lansing, Mich., which for the past 8 years has been manufacturing Never-Miss spark plugs and electrical goods, has sold its entire business, good will, etc., to the Lockwood-Ash Motor Co. of Jackson, Mich., manufacturer of marine engines and engine supplies. As soon as the new factory which is being built at Jackson, Mich., is completed the business will be removed from Lansing to Jackson, under the trade name of Lockwood-Ash Motor Co., which will manufacture a line of Never-Miss specialties under the old name as heretofore. W. L. Ash, who was president of the Never-Miss Mfg. Co., also is president of the Lockwood-Ash Motor Co., and will be identified with the trade

as in the past. A new factory at Jackson, two floors, 80 by 80, is being completed. The office will be permanently located at Jackson in November.

Change of Referees—The application for the transfer of the bankruptcy matter of the Norwalk Motor Car Co., from Ben B. Wickham, referee for Huron county, to some other person, on the ground that he is a stockholder in the company and an interested person, was acted upon favorably by Judge Killets, at Toledo. The judge appointed Frank E. Seager, of Fremont, referee in bankruptcy for Sandusky county, to have charge of the matter.

Packard Breaks Records—In closing up its September business, the Packard Motor Car Co. shipped fifty-six passenger cars and fourteen trucks on the last day of the month, establishing another new high mark for one day's consignments by that concern. This trainload is an increase of 32 per cent over the best previous record made just 1 month earlier. Of the fifty-six pleasure cars, thirty-five were sixes, bringing the total for the month up to 215, which exceeds the factory estimate on cars of this type. The shipments for the closing week in September also set a new mark for Packard output in such a period, the total being 172 cars.

Death of Milwaukee Dealer—Albert Smith, 169 West Water street, Milwaukee, representative of the Palmer-Singer in that territory and for many years a well known electrical man, is dead after a short illness, aged 48 years. Mr. Smith's death is attributed directly to a bantering wager with George Harvey, of Cleveland, O., that he could drive from Milwaukee to Cleveland in 2 day's time without extra effort. With Mr. Harvey as a passenger, Mr. Smith easily won the wager in a two-passenger Palmer-Singer, but in doing so Harvey contracted pneumonia, which resulted fatally within a week of the drive.

Reo Inventory Completed—The Reo plant at Lansing, Mich., has resumed operations following the annual inventory, and every department of the plant presents an appearance of activity. General Manager Richard H. Scott is authority for the statement that contracts with deposits have been closed for 10,243 cars to be delivered during the coming year, and he also states that the list of agencies has been increased 100 per cent over that of last year. There are dealers in ninety-six cities who have not closed contracts but who are desirous of securing the agency for the Reo car. As fast as the material for the 1912 car arrives the working force of the plant will be increased. With the proposed increase the force

will number more than 1,700 workmen. The report rendered at the annual stockholders' meeting of the company shows a surplus of \$1,250,000, with \$1,000,000 in cash on hand.

Makes Plans to Distribute Output—The Marshalltown Motor Material Mfg. Co. has established distributing points at Chicago, Detroit, Baltimore, Oakland, Cal., Sioux Falls, S. D., Cleveland, Tama, Ia., Minneapolis, St. Louis, Indianapolis, and Hannibal, Mo., for its V-Ray spark plug, an exponent of the four-point spark-plug theory.

Nehrbas Joins Alco Forces—Fred P. Nehrbas, formerly connected with the Thomas company, will act as factory manager of the American Locomotive Co.'s plant at Providence, where the Alco cars and Alco trucks are built. He also will be a member of the engineering committee of the motor car department of the American Locomotive Co.

New North Carolina Enterprise—The Corbett Automobile Co., of Henderson, N. C., has been incorporated with \$250,000 capital, to take over the motor car department of the Corbett Buggy Co., which has been manufacturing light cars for the last 3 years in a limited way. The new company expects to make 500 cars during 1912 and its new models will be ready for distribution November 1. It will build pleasure cars.

Reo Truck Report—At the annual meeting of the board of directors of the Reo Motor Truck Co. a 10 per cent dividend was declared. At the meeting the official reports were read and the following elected as members of the board of directors: R. E. Olds, Richard R. Scott, J. Edward Roe, H. T. Thomas and Donald E. Bates. After the meeting of the stockholders adjourned, the directors met and elected officers as follows: President, R. E.

Olds; vice-president and general manager, Richard H. Scott; secretary and treasurer, J. Edward Roe; assistant secretary and treasurer, Donald E. Bates; consulting engineer, H. T. Thomas.

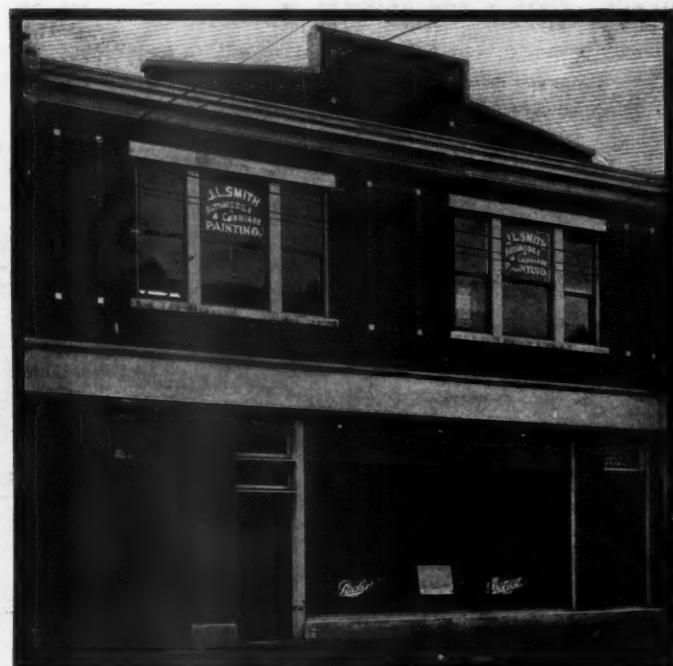
Cork Insert Royalty Reduced—The Cork Insert Co., of Boston, announces a reduction in royalty for the right to use cork inserts in clutches and brakes. Now it is to be 90 cents on clutches transmitting less than 25 horsepower and \$1.25 on clutches over that. A charge of 50 cents per car is charged on brakes.

Truck Business Segregated—During the past year certain parts of the truck have been manufactured at the Reo factory, while other parts have been built at the plant on South Grand avenue, at Lansing, Mich., formerly occupied by the Bement company. Hereafter the entire truck will be constructed and assembled at the Grand avenue factory, and it is estimated that about 500 men will be employed.

Grand Rapids Show Dates—The third annual show at Grand Rapids, Mich., is scheduled for February 14, 15, 16 and 17. This will be the third annual undertaking of the sort by the distributors and manufacturers of Grand Rapids under the auspices and management of the Herald Publishing Co. The show will be held either in the Klingman building, as heretofore, or in the new Coliseum. C. L. Merriman, of the Herald Publishing Co., will have charge of space allotments.

Have Hopes at Findlay—The work of taking an inventory of the Findlay Motor Co.'s stock in Findlay, O., John M. Barr being appointed receiver, has begun and will probably take 10 days. Coupled with this fact comes the announcement that eastern stockholders of the company are working out a plan for reorganizing the company, and that the same will be promulgated shortly after an inventory is filed. It is hoped that the plant will be in operation within the next 6 weeks.

Overland Still Crowded—The big addition to the Willys-Overland Co.'s plant at Toledo is nearing completion. The new building is four stories high, 300 feet wide and 400 feet long, and of concrete construction. It was expected that with the completion of this addition all Overland cars could be constructed in Toledo, but orders have been coming in so rapidly that the company has found that the mammoth Toledo plant will be unable to take care of the business. Announcement is made this week that the concern has been forced by the volume of trade to continue operations at the Indianapolis plant, and several thousand of the 30-horsepower cars will be built in that city.



PACKARD AND DETROIT ELECTRIC AGENCY, DAVENPORT, IA.



The Motor Car Repair Shop

A SHORT time ago the writer had an opportunity of driving a car whose operation made a most favorable impression. The clutch went in smoothly and took hold gently but firmly, the gears could be shifted with the utmost ease and without the grinding noise generally created when a person operates a strange car for the first time, and to complete the joy of operation the steering wheel could be turned with hardly no effort whatever. A couple of days later another opportunity presented itself and was looked forward to with delight, but on taking hold of the steering wheel it was found to turn very stiffly. Upon reporting the change to the owner, he simply stated that there had been too much lost motion in the steering wheel and he had adjusted it. The fact of the matter was that he had tightened down the thrust bearing adjusting nut at the top of the steering-gear mechanism until the steering wheel turned so hard that he thought that the lost motion was removed; instead of eliminating the lost motion, he had put a severe strain on the thrust bearings and made the operation of the wheel very difficult.

The adjusting nut on the steering column either at the top or bottom of the steering-mechanism case is only capable of eliminating longitudinal lost motion of the steering column, and never should be tightened sufficiently to cause the steering wheel to turn harder than usual. In adjusting this nut, the front wheels should be jacked up off the ground, the wheels should be turned from left to right by means of the steering wheel, and the nut screwed down as tightly as possible without increasing the effort required to turn the wheels. Other adjustments generally are provided for taking up lost motion existing in other parts of the mechanism, and Motor Age would advise that where lost motion is found in the steering wheel

Hints for the Amateur

the operator either should take his trouble to a competent repairman; consult the manufacturer, or his instruction book; or write the Reader's Clearing House department.

Lost motion in the steering mechanism of a motor car often is due to wear or want of adjustment in the steering rod connections, and this is dangerous. If the rods are provided with yokes and pins, and the yoke eyes and pins are worn, these parts should be repaired or replaced as quickly as possible. Where ball and socket connections are employed, the plungers in the sockets should be kept in adjustment and properly oiled. Compression grease cups generally are provided on the steering mechanism case, and it is good practice to fill these with cylinder oil occasionally and force sufficient of it into the case that it begins to work out past the bearings; then refill with a grease that is not too stiff.

As an example of the various adjustments to be found on a steering mechanism, the Chalmers steering gear, Fig. 1, serves the purpose very nicely. Section I shows the hardened thrust washers and ball thrust bearings; and lost motion of the post T in a longitudinal direction may be adjusted by taking up on the adjusting collar P. Should lost motion develop between the worm W and the pinion D, the pinion gear D may be thrown closer to the worm by rotating the eccentric housing E, section 2, of the bearing bushing F until the lost motion disappears. Lost motion through end play in the ball arm shaft G may be taken up by the trust screw H, section 2. The clamp bolt Z, section 3, which locks the eccentric bearing cage, has a spanner ring upon its outer end at J. The bolt Z should be clamped

down hard when proper adjustment has been secured. The ball arm K may be seen securely clamped to the end of the horizontal shaft. This clamp bolt cuts through the corner of the square shaft to prevent lateral movement of the ball arm.

In section 4, at A, is shown a clamping screw locking the tube B which carries the spark and throttle quadrant above the wheel. Should looseness develop in connection with this quadrant, one must set up tight upon the adjustment at A.

Cleaning the Engine

A local repair shop and garage has an unusual method of cleaning the cylinders of a motor car which is claimed to give excellent results. When a car comes in for an inspection, cleaning or overhauling, kerosene is squirted onto the cylinders while they are still very warm and practically all grease and dirt loosened up or cleaned off; this is followed by a thorough washing with water, warm water whenever convenient. Before starting the cleaning operations, of course, the magneto and carburetor are covered to protect them from dirt and water. By thoroughly cleaning the engine while warm, the oil or grease upon it is soft and may be easily removed, and when the cleaning operation is completed the warmth of the cylinders greatly facilitates drying. In fact, they will dry off without manual assistance, but if wiped with a cloth when almost dry the cylinders generally will take on a bright glossy finish that is glorious to behold. And that is not all. By thoroughly cleaning up the motor in this way one gets into the excellent habit of inspecting the motor thoroughly at each cleaning; thus many timely adjustments are made that otherwise would be neglected; and the motor gives better service and becomes a credit to both its owner and keeper.

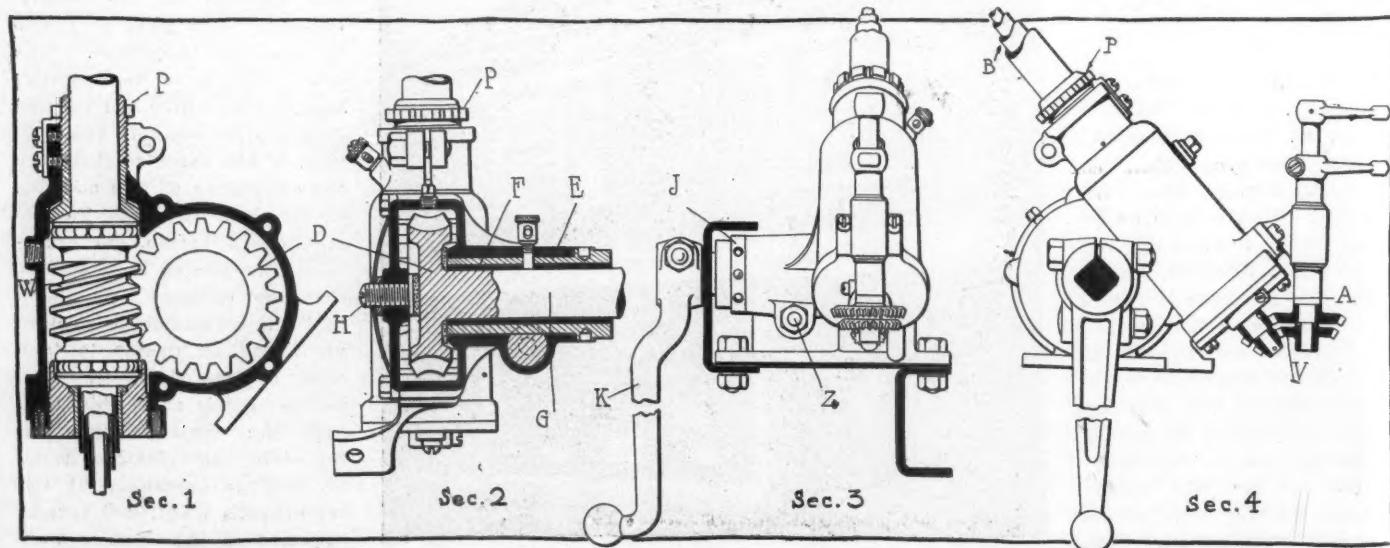


FIG. 1—SHOWING HOW AND WHERE TO TAKE UP LOST MOTION IN AN ADJUSTABLE-TYPE OF STEERING MECHANISM

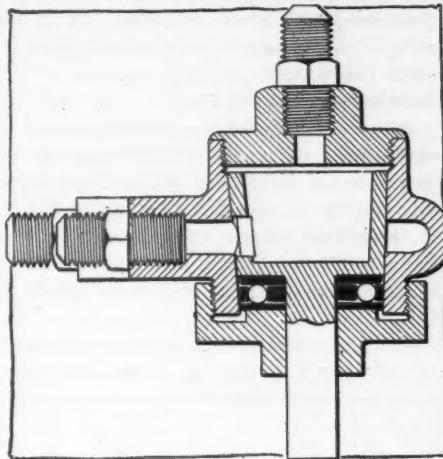
Current Motor Car Patents

J ENKINS Gas Motor Starter—No. 1,003-752, dated September 19; to Charles Frances Jenkins, Washington, D. C. This patent pertains to a self-starting mechanism whose chief feature is the valve shown herewith. The patent pertains to a distributing valve apparatus for fluids under pressure, having in combination a valve casing with interiorly converging lateral walls and a series of lateral discharge openings, of a hollow valve revolvably fitting in the casing, open at its large end and provided with a lateral port in position to register with the openings in succession as the valve rotates, a cap closing the larger end of the casing and provided with an inlet for supplying fluid under pressure to the interior of the valves, an unyielding friction bearing at the smaller end of the valve, to resist the inward thrust of the fluid upon the valve, and means for rotating the valve for the purpose of distributing the fluid.

Martel Tire Patching Device—No. 1,003,003, dated September 12; to Gustave J. Martel, Chicago. This patent covers a tire patching device comprising a flexible patching strap extending over the tread portion of the tire, members detachably engaging the rim at opposite sides, one of the members being secured to one end of the strap and the other member being provided with an inwardly extending arm and an outwardly extending projection bearing against the side of the tire, and an adjustable connection between the other end of the strap and rim as illustrated herewith.

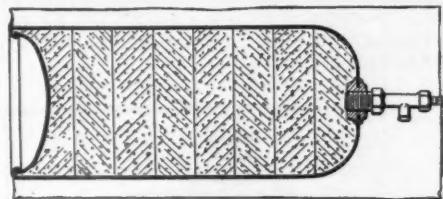
Humphreys Rotary Engine—No. 1,003-263, dated September 12; to Ira Boyd Humphreys, Denver, Colo. This patent covers an explosion engine of the compression type comprising a main cylinder, two auxiliary cylinders in communication

Ideas of the Inventors



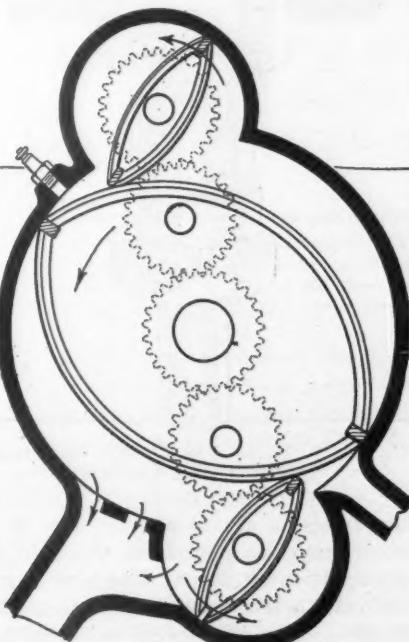
JENKINS MOTOR STARTER

therewith, an oval-shaped revolvable piston in the main cylinder, and of a length fitting the internal diameter of the cylinder, a revolvable abutment in each auxiliary cylinder, the abutments being oval-shaped and of a length fitting the cylinders, means for revolving the abutments



ACETYLENE TANK DESIGN

and the piston in the same direction, the shape of the piston being such and the

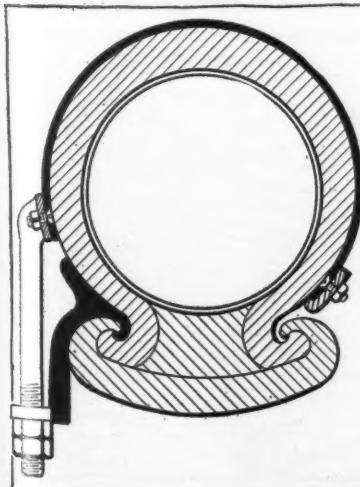


HUMPHREYS ROTARY ENGINE

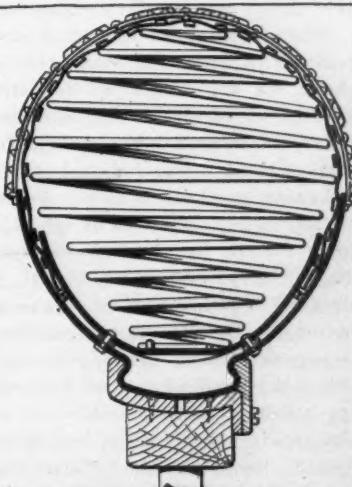
location of the abutments such that the ends of the abutments engage the sides of the piston and the ends of the piston engage the sides of the abutments as the parts are revolved, an intake port at one side of one of the auxiliary cylinders and an exhaust port at the other side, an ignition means located adjacent the other auxiliary cylinder and between it and the exhaust ports as shown in the central illustration at the bottom of the page.

New Acetylene Tank Design—No. 1,003-559, dated September 19; to Milton C. Whitaker and Floyd J. Metzger, Yonkers, N. Y. This patent pertains to an improvement in the construction of a storage tank for acetylene, comprising a container constituted in whole or in part of a metal of the copper group, a porous filler therein, a solvent for acetylene therein, and a substance therein soluble in the acetylene solvent which will prevent and react between acetylene and any part of the container, and which will not injuriously affect the contents of the acetylene gas container.

Sundvall Spring Tire—No. 1,003,071, dated September 12; to Edwin A. Sundvall, Stockholm, Wis. The tire to which this patent relates comprises a plurality of cushion elements, an inner ring in which the elements are carried, this ring being channeled, an outer channeled ring, spacing devices encircled between the inner portions of the rings and connected to the same to hold them in spaced relation to each other, the outermost ring being formed at intervals with inwardly projecting nibs, a protecting layer encircling the cushion elements and having its side edges inserted between the outer edges of the rings, and a tread element enveloping the projected layer and secured at its side edges to the outer ring as shown in the accompanying illustration.



MARTEL PATCHING DEVICE



SUNDVALL SPRING TIRE



Development Briefs

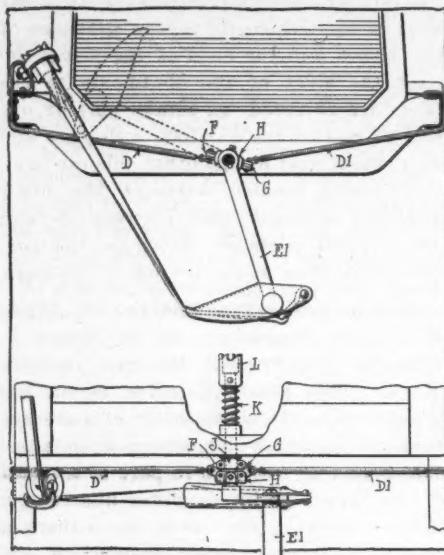


FIG. 1—DETAILS OF PULL-MAN MOTOR STARTING DEVICE

Pull-Man Motor Starter

ANOTHER of the arrangements for turning the motor over from the driver's seat is called the Pull-Man motor starter, and is manufactured by A. M. Walstrom, of Minneapolis, Minn. The general construction is illustrated in Figs. 1 and 2. In Fig. 1 is shown the front view of the car with the starter installed. A shoe is rigidly attached to the starting crank handle, having at one end a pin for the attachment of the strap which runs over a pulley, shown at the right, to the driver's seat. The other side of the shoe is provided with a groove to guide the strap. The handle B, Fig. 2, on the end of the strap is held in a catch C when not in use. The plan view, Fig. 1, shows the method by which the starting crank is made to engage with the end of the motor crankshaft. A toggle joint, F and G, hinged on the stationary collar H operates the sliding sleeve J and forces the jaw clutch member L into engagement.

When not in use the crank occupies a position midway between the positions shown by the solid and dotted lines in above, but when the handle B is released from the bracket C the springs D and D1 retract the starting crank to the position indicated by the full lines. At this point the springs D and D1 will open the toggle joint formed by the links F and G and draw the permanent collar H and the sleeve J together and allow the spring X to project the jaw clutch member L into engagement with the engine crankshaft. When the handle is pulled back the starting crank is given one-third of a revolution, taking the position indicated by the dotted lines above. This straightens the toggle joints and overcomes the spring K, withdrawing the crank E from the en-

gine crankshaft. In this way the shifting of the starting crank is automatically performed, the operator merely giving the strap the necessary number of pulls to start the motor.

Lubricator for Ford Cars

A special oiling system for application to model T Ford cars has been brought out by the Pederson Lubricator Co., of New York. The system as installed is shown in Fig. 6. It consists of a small rotary pump P1, Fig. 6, an indicator, Fig. 4, and an oil tank C, Fig. 6. The pump is shown in detail in Fig. 3.

The pump, which is mounted on the shaft of the timer T, draws the oil from the tank,

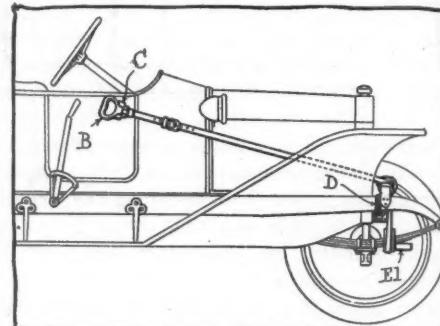


FIG. 2—SIDE VIEW OF CAR SHOWING INSTALLATION OF PULL-MAN MOTOR STARTER

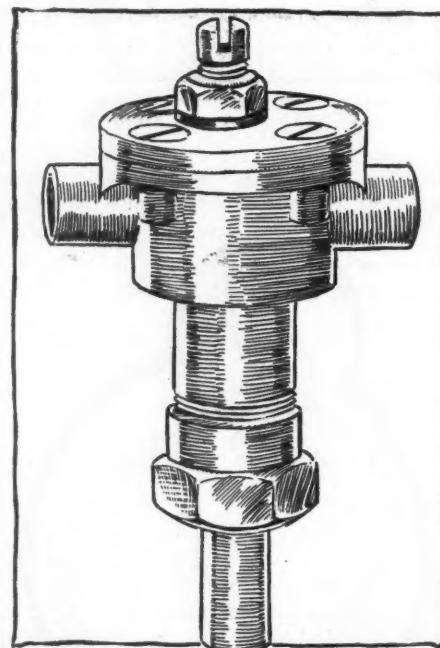


FIG. 3—OIL PUMP USED WITH PEDERSON LUBRICATION SYSTEM

then forces it up through the pipe S to the indicator on the dash, which is the upper portion of Fig. 6. The pipe is provided with a thumb screw F for regulating the feed. From here the oil is led down to the crankcase. The tank has large oil capacity and when the feed is once regulated

to supply the proper amount of oil, no further attention is required.

A novel arrangement in connection with this system is the provision for oiling the commutator. The end of the stuffing box nut extends through the cover and by turning the nut up only moderately tight, a slight leakage is allowed, which keeps the commutator supplied with oil.

Cloth Timing Gears

Cloth pinions are being used by the General Electric Co., for power transmission, because of the quietness accompanying their use. The blanks from which the pinions are cut consist of a filler of cotton or similar material, confined at a pressure of several tons to the square inch between steel shrouds or side plates, the whole structure being held together by means of rivets, or in the case of a very small pinion of a threaded sleeve. After the teeth are cut the cloth filler is saturated with oil. Such pinions are claimed to be impervious to moisture and not to be affected by atmospheric conditions.

The teeth are cut to the 14.5 degree involute system, according to the Brown and Sharpe standard. It is claimed that the teeth are stronger than those of any type of non-metallic pinion, and possess sufficient elasticity to allow the meshing teeth to bear evenly across the full width of the face. Pinions of this type under test for 2 years have not shown any appreciable sign of wear. It is expected that such pinions would be satisfactory for timing gears in motor cars.

Crone Priming Pump

Fig. 7 illustrates a small pump for introducing a charge of gas into the cylinders of the motor before the starting of the engine; that is, before there is any suction produced in the cylinders. This is the Crone priming pump and is attached at its lower end to the drip cock of the carburetor, which is left permanently open, and from which the gasoline supply is



FIG. 4—SIGHT OIL FEED OF PEDERSON SYSTEM FOR FORD CARS

taken. The pump is operated by a small bell crank, to which is attached a rod passing through the radiator. A few draws on the rod before turning the engine over is sufficient to force a charge of gasoline into the cylinder, after which the primer is closed automatically by a needle valve. The primer is made by F. G. Crone, Buffalo, N. Y.

High Voltage Electric Lamps

The employment of electric lamps on motor cars operating with a voltage between 21 and 90, to suit the requirements of traction batteries, marks a new departure in the lighting field. This voltage contrasts with the 6-volt lamps in present day use. These new high-pressure lamps use a tungsten filament which is claimed to be rugged enough to withstand motor car service. The lamps are in sizes suitable for head, dash and tail lamps. The bulbs are made in two sizes, rated at 15 and 25 watts, respectively, corresponding roughly to 12 and 20 candle-power. The bulbs are spherical and are fitted either with the standard Edison base or the small skirted candelabra base. It is claimed that these lamps will give three times as much illumination as a carbon filament lamp of the same ampere draw. The light is further claimed not to fluctuate so seriously with fluctuating terminal voltage.

The development laboratories of the National Electric Lamp Association, Cleveland, O., have been working on these new types of lamps for some time and, according to Roscoe Scott, of that organization, these lamps are, according to test, perfected as a commercial product.

New Enamel for Lamps

The Hardy Paint and Varnish Co., of Toledo, has perfected an enamel for use on lamps and other brass work. The Hardy system consists of a primer and one coat of enamel, each being baked for several hours. It is claimed that lamps can be heated until solder will melt without affecting the enamel, and that cold water thrown upon it at a temperature of 250 to 300 degrees will not crack it.

Breath Deflector

Just as goggles are needed for the eyes when driving at high speed or on dusty

roads, so is needed some sort of protection for the delicate linings of the mouth and nose. The Sanitary Shield Co., of Richmond, Va., has put on the market a protecting shield which may be worn over the mouth and nose to prevent the wind striking those portions of the face directly and to intercept the dust of the road.

The deflector is made of aluminum and celluloid and is illustrated in Fig. 5. It consists primarily of a tube, curved to fit the face and having in its inner surface a widened opening to fit the nose and mouth. Bows like those of spectacles are fitted to pass over the ears to hold the shield in place. It is light and is said to be not at all uncomfortable for the wearer. The opening at each end of the curved tube points backward and thus the breath, as it is exhaled, passes out to the rear; as it is inhaled, it

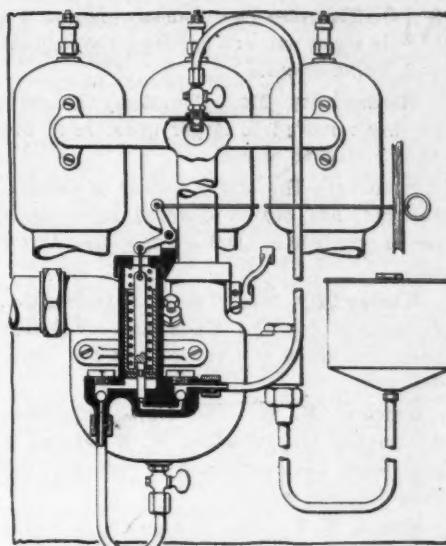


FIG. 7—CRONE'S PRIMING PUMP AS FITTED TO MOTOR

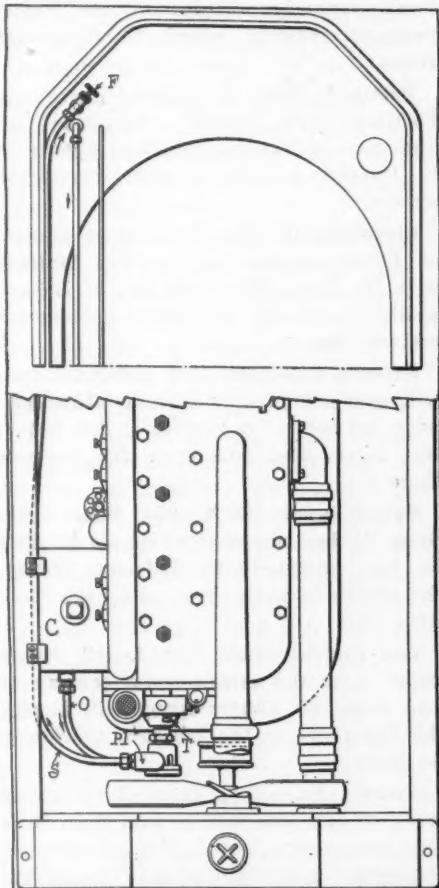


FIG. 6—PEDERSON LUBRICATING SYSTEM
This shows the installation on Ford cars.
The upper part is a view of the dash and the lower part is a view of the motor from above

is taken from the side of the head and not from in front. By a very simple arrangement inside the tube the air may be filtered and dust prevented from entering the lungs.

Dusell Klip-Leggings

Leather leggings as a protection to the motorist's clothing find a wide use throughout the year, but with the coming of the winter season their scope is broadened, owing to the added feature of warmth.

A physician who found himself in need

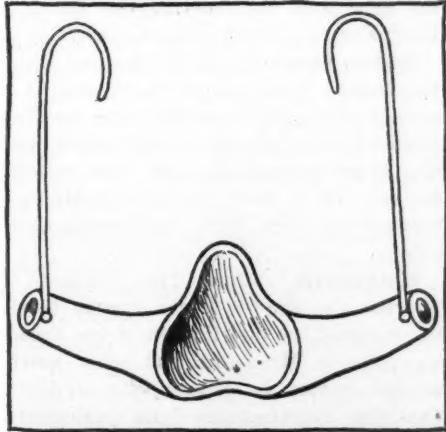


FIG. 5—BREATH DEFLECTOR FOR MOTORISTS

of high leggings that could be put on and off without loss of time in case of a hurry call, invented a style of legging that could be snapped on to stay. These are now on the market under the name of Klip-leggings, and are made by the Dusell Co., of Philadelphia, Pa. They are made with steel frames which fit the leg and snap into sockets to hold them on, consequently no straps or buckles are required. The leggings are made with either knee or ankle extensions or without either.

Sanitary Goggles

One of the latest designs of goggles, intended to give an unobstructed view for the motorist and yet afford plenty of ventilation to the eyes has been produced by the Sanitary Sales Co., of Bradford, Pa. The goggles are made of a transparent colorless material, and as there are no eye sockets or opaque partitions vision is not obstructed in the least. The lower portion reaches down to the end of the nose, leaving a space on each side for ventilation. The lining is of soft strong fabric. The whole thing is comfortable and protects the nose as much as the eyes.

Red Cross Radiator Ornament

Physicians have taken to the use of some form of distinctive sign for their cars in order that they may have the benefit of the tacit agreement with the traffic authorities by which they are allowed to break the speed ordinances in answering hurry calls. The more conspicuous the sign the more readily will it clear the way for the physician and the less likely will he be to run down the unwary pedestrian.

A sign of this kind designed to be placed in the most conspicuous position about the car, that is, on the filler cap of the radiator, and one which will be more of an ornament than a disfigurement, is marketed by the Motor Car Equipment Co., New York. It is called the red cross radiator ornament and is made of metal in the form of a double cross. It is 3 inches high and 2½ inches wide.

MONTREAL—The Ramsay Motor Co. is a new concern handling the Schacht and Pullman cars.

Kansas City, Mo.—The Remy Magneto Co. has removed to larger quarters at 509 East Fifteenth street.

Montreal—The Motor Import of Canada, Limited, has been appointed sales agent in the province of Quebec for Pierce-Arrow cars.

Kansas City, Mo.—The A. J. Davies Co., distributor for the Knox and Chadwick cars, has taken the agency for the Bergdoll car.

Concord, N. H.—The New Hampshire Automobile Co., of which W. E. Darrah is proprietor, has contracted to represent the Franklin this season.

Elmira, N. Y.—The Southern Tier Motor Co. has been signed up by the Franklin Automobile Co. as its representative in this locality. G. W. Shoemaker is president.

Omaha, Neb.—The Moline factory is planning the opening of a branch in Omaha. A factory representative was in the city last week, looking for a salesroom.

Philadelphia, Pa.—The Patton-Crumley Auto Co., local distributor of the Warren commercial delivery car, is installed in new headquarters at 660 North Broad street.

Seattle, Wash.—H. L. Solnave has acquired the interests and location of the Eureka Motor Co. at 1414 Broadway and will hereafter conduct the establishment as a garage and repair shop.

Columbus, O.—F. E. Avery, 1199 Franklin avenue, Columbus, Ohio, has taken the central Ohio agency for the Packard and the Waverley electric. The territory covered on both cars consists of seven counties.

Billings, Mont.—Rainsford French has purchased the interest of M. B. French in the firm of French Brothers of Billings and will continue the business under the name of French garage, handling the Chase truck.

Kansas City, Mo.—The Winton branch has swapped quarters with the Franklin Nicols Co., the former now being located at 3324-26 Main and the latter taking the quarters of the Winton, located at 3328-30 Main street.

Omaha, Neb.—The Auburn factory has just opened a branch in Omaha. W. T. Wilson, formerly of Osceola, will be the manager of the Omaha Auburn Auto Co. The car was previously handled by A. S. Avery, of the Omaha Automobile Co.

Indianapolis, Ind.—Another three-story reinforced concrete building is being added to motor row, in North Capitol avenue, by the Globe Realty Co. It will cost \$60,000 and will be completed February 1. The building will be at the southwest corner of Capitol avenue and Michigan street and will be occupied by the Hender-

Brief Business

son Motor Sales Co. and the B. F. Goodrich Co.'s tire sales branch.

Boston, Mass.—George L. Cooke has just been appointed manager of the local agency for the Morse car.

Syracuse, N. Y.—W. E. Hookway has taken over the agency for Atterbury trucks, along with the Reliance line of heavy trucks.

Denver, Colo.—The Michaelis-Middlekauff Auto Co. has moved from its old quarters at 1650 Glenarm street to 1709-13 Tremont place.

Boston, Mass.—The S. G. V. agency is now located on Boylston street in the sales-rooms formerly occupied by the Napier company, having moved from Ipswich street.

Portland, Ore.—A modern garage in Portland was recently completed for Thompson & Nation, Speedwell agents. It is located at Couch and Fourteenth streets.

Cleveland, O.—The Windermere garage, on Euclid avenue, has signed a contract with the Ideal Motor Car Co., of Indianapolis, for the sale of Stutz cars in northeastern Ohio.

Atlanta, Ga.—The Velie Motor Co. soon will open a branch in Atlanta. This company has secured a location at 447 Peachtree street and will open for business there.

Grand Rapids, Mich.—The Moran Auto Sales Co. has moved from its old location on Kent street to 91 Jefferson avenue, the garage formerly operated by the Riley Auto Co.

Los Angeles, Cal.—The Lovell Motor Sales Co. is the newest motor concern in Los Angeles. The company will handle the Colby car in the southern California territory.

Atlanta, Ga.—Hupp-Yeats electrics and R. C. H. cars soon will be sold from their own branch in Atlanta. The new store at Peachtree and North avenue is nearing completion.

Columbus, O.—The Charles Shiear Motor Car Co., Fourth and Spring streets, Columbus, has taken the 1912 agency for the Hupmobile. The territory covered by the concern, which has headquarters in Cincinnati, is all of central and southern Ohio.

Indianapolis, Ind.—With an authorized capitalization of \$50,000, the Merchants Auto Co. has been organized and incorporated in Indianapolis and will make a specialty of garaging commercial cars, although pleasure cars will also be handled. The company has leased quarters at 320 and 322 North Delaware street, to which a two-story addition is being erected. Harvey B. Stout, an attorney, has been

elected secretary and general manager of the company.

Ironton, O.—Leo Feuchter and A. S. Jenkins have opened a new garage and repair shop in Ironton.

St. Louis, Mo.—Clifford R. Garrison has been made manager of the Phoenix Auto Co., 3972 Olive street, succeeding Frank Bishop.

Chicago—The Lexington Motor Co., 2015 Michigan avenue, handling the Lexington and Decatur truck, has taken the Paige-Detroit agency.

Boston, Mass.—The Lexington car has been dropped out of the Boston colony, A. M. Davis, who handled it for several months, having given it up.

Ellsworth, Wis.—The name of the company formed by C. W. Morton and Alfred Larson is the Morton-Larson Auto Co., instead of the Morton-Flanders Co., as first reported.

Zanesville, O.—The Wedge garage has been opened on South Sixth street, with Perry D. Gath as manager. The company has taken the agencies for the Maxwell, Columbia and Hupmobile.

Boston, Mass.—Linville McKie of East Boston has accepted a position with the truck department of the Velie Boston branch. He was formerly with the Atterbury Truck Co.

Buffalo, N. Y.—N. E. Oliver, manager of the Diamond Rubber Co., is about to take up his residence in New York, taking charge of the New York branch of the Diamond company and all eastern territory of that company.

Columbus, O.—Edward Updyke, state sales agent for the American, has moved his headquarters to Columbus, where he will be associated with the Hudson Sales Co. on North Fourth street, local agent for the American.

Minneapolis, Minn.—The Baker electric is to be handled by M. L. Hughes and A. H. C. Dalley in the Twin Cities and the northwest. Mr. Hughes and Mr. Dalley have been representing the Rauch & Lang electrics for the past 2 years.

Boston, Mass.—M. D. Kidder has joined the factory force of the Moon and he is now the traveling representative for New England, making his headquarters with the Andrews-Dykeman firm that handles the car. E. J. Moon is dividing his time between the New York and Boston agencies.

Minneapolis, Minn.—The Hudson & Thurber Co., 308-318 Third avenue north, has assumed the distribution of the Speedway line in Minnesota and other northwestern states in Minneapolis territory. This firm manufactures farm implements. Locally the Speedway is to be carried by the new motor car sales and repair firm,

Announcements

the Motor Repair and Equipment Co., 206-210 Washington avenue north.

Canton, O.—The Franklin Automobile Co. will be represented in this city this year by W. H. Burgener.

York, Pa.—H. H. Smyser, 739 West Philadelphia street, has taken the agency for the Hupp-Yeats for 1912.

Minneapolis, Minn.—H. J. Mich & Co. will represent the Franklin in this city and seven of the nearby counties of Minnesota this season.

Kansas City, Mo.—The Detroit electric branch of this city now is occupying its new quarters at 3105 Main street. This building is three stories and basement.

Milwaukee, Wis.—The Lozier Motor Sales Co., 197-199 Ogden avenue, state distributor for the Lozier, has been appointed agent for the Marion, which heretofore has been represented by George W. Browne, 460 Milwaukee street.

Plainfield, Wis.—Baldwin & Co., who have been operating a garage and repair shop here, have retired from business and are succeeded by P. W. Rindfleisch, member of the partnership. The garage will be known as the Plainfield garage.

Pittsburgh, Pa.—The Pittsburgh Motor Car Co., which has offices at 1109 Empire building, expects to secure a suitable site within a short time on which to build a new plant. It has had plans prepared for a one-story building 90 by 238 feet.

Richmond, Ind.—The following dealers have been given the agency for Westcott cars for the season of 1912: Price Implement Co., Zanesville, O.; Ye Motor Shop, Connerville, Ind.; W. H. Miller, Champaign, Ill.; George J. Smith, Peoria, Ill.

Dayton, O.—George L. Baker and Frank L. Baker have opened a motor livery service at 122 South St. Clair street. George Baker will remain in charge of the retail sales department of the Speedwell Motor Car Co., the new venture having no direct connection with his work of selling Speedwells.

Denver, Colo.—E. W. Swanbrough, branch manager for the Hupp-Yeats electric, has taken the agency for the new R. C. H., and will move next month to larger quarters at 1520 Broadway, the building soon to be vacated by the Fernald Auto Co. The new location has floor space of 50 by 125 feet.

New York—The similarity of names and long prominence of both with the Diamond Rubber Co. has caused some confusion for O. J. Woodward and H. J. Woodward on the occasion of the latter resigning the New York management of the company recently. O. J. Woodward is still manager of the truck tire and wire departments at the Diamond factory in Akron

and H. J. Woodward is now manager of the Century Tire Co. of New York.

Denver, Colo.—W. J. Garcia has been appointed Reo agent at Montezuma, Colo., by the Mathewson Auto Co., Reo representative in this city.

Omaha, Neb.—The Marion Automobile Co. has taken the agency for the Marmon cars. The company already has the Marion and Overland cars.

Omaha, Neb.—The E. R. Wilson Automobile Co., of Omaha, has taken the agency for the Paige-Detroit car. The company at present handles the Lexington.

Sandusky, O.—Hugo Ohly, Jr., has closed a deal for the purchase of the Maxwell garage on Market street, from Charles L. Blatz. Ohly will abandon his old garage on Jackson street.

Columbus, O.—The O. G. Roberts Co., which operates a sales agency and garage at 933 East Gay street, completed a large addition to its plant which will increase its space by one-third.

Columbus, O.—The Oscar S. Lear Automobile Co., 288 East Long street, has taken the agency in seven counties in central Ohio for the Oldsmobile and Oakland for 1912. The same company will handle the Kelly truck over the same territory.

Kansas City, Mo.—W. S. Hathaway, general supervisor for the United States Motor Co., has decided to retire from the motor car business. Mr. Hathaway is the second oldest dealer in Kansas City. He has no plans for the future except to rest.

Milwaukee, Wis.—The Wisconsin Auto Sales Co. has been appointed Wisconsin distributor for the National, Cutting, Herreshoff and Westcott cars. The company has temporary headquarters at 114 Mason street, in the Colby-Abbot building.

Green Bay, Wis.—Lawrence Kittell and Charles W. Collier have formed a partnership under the style of Fox River Motor Car Co., and will handle the Ford in this territory. A garage and salesrooms have been opened at 510-512 South Monroe street.

Kenosha, Wis.—Frederick Purdy, for many years with the Thomas B. Jeffery Co., has purchased the interest of the Kent brothers in the Kent Motor Car Co. and will henceforth conduct the garage on Church street. Mr. Purdy retains the name of Kent Motor Car Co. and the agencies held by the corporation.

Grand Rapids, Mich.—George P. Dowling, long identified with the local motor car trade as manager of the Buick sales agency, and for the past 18 months in charge of that factory's Toledo branch, will shortly return to Grand Rapids to resume activities here in behalf of the Buick concern. Mr. Dowling will become

the factory's territorial representative for Kent, Ottawa and Alleman counties.

Pittsburgh, Pa.—The Auto Trade Co. has been moved into its new home at Center and Euclid avenues, east end.

Dallas, Tex.—The W. G. Langley Co., the Franklin dealer in Dallas, has secured a lease on a new brick building, 30 by 100 feet, at 1713 Palmer street.

Zeeland, Mich.—The Zeeland Automobile Co. has purchased a new location on the corner of Main and Washington streets. The company will move its old building to the new site immediately.

York, Pa.—Harry R. Pfeiffer, 537 West Market street, has taken the agency for the Stoddard-Dayton. Mr. Pfeiffer has the sole agency for the Baker electric for York, Adams and Lancaster counties.

Minneapolis, Minn.—Walter D. Rightmire has opened a branch at Duluth, where he has secured the Iron range as a territory on the Packard line. He already has taken over the line and installed a service department for the convenience of Duluth patrons.

Indianapolis, Ind.—A factory sales branch of the Auburn Automobile Co. has been opened at 518 North Capitol avenue, with F. P. Ballinger in charge as manager. Formerly Auburn cars were handled in Indianapolis and vicinity by Finch & Freeman.

Montreal—The liquidators of the National Motor Car Co. of Canada, Limited, are calling for tenders for the sale of the business, which consists principally of stock in trade, furniture, fixtures, machinery and tools, the whole valued at \$3,971.24.

Montreal—Newly incorporated companies include the Auto Tire Manufacturers Co. of St. John's, Que. Dunnings, Ltd., Montreal, has been granted a dominion charter for the purpose of carrying on a motor car business with a capitalization of \$20,000.

Columbus, O.—Kimmell Brothers, 215 North Fourth street, have taken the agency for the Speedwell and Empire for 1912. Subagencies have been contracted for the Empire as follows: Point Pleasant, W. Va., Edward L. Felson; Dayton, Ohio, Baker & Weaver.

Boston, Mass.—The Teel Mfg. Co. of Medford, one of the suburbs of Boston, a concern that has been building wagons and tops for years, has embarked in the commercial truck field and is now manufacturing a 5-ton vehicle. It is to be called the Teel truck.

Indianapolis, Ind.—New agents to handle the Cole 30-40 have been secured during the past week as follows: Houston, Tex., Auto Co., 411 San Jacinto street; Worcester, Mass., N. S. Knickerbocker; Rockville, Conn., Snow Hardware Co., 36 Union street; Jackson, Miss., R. S. Withers; Gulfport, Miss., J. F. Payne; Westfield, Ill., C. M. Bennett; Decatur, Ill., F.

Burrous, 158 Thatcher place; Richmond, Va., William P. Forbes.

Grand Rapids, Mich.—The Palmer Sales Co. has secured space with the Hupmobile garage on North Ionia street.

Denver, Colo.—The Boss Rubber Co., 1614 Broadway, has assumed the Denver agency for the Mercer car.

Fond du Lac, Wis.—The Crescent Garage Co., North Main street, has started work on improvements. The addition will more than double the floor space.

Los Angeles, Cal.—Lewis Schwaebe, president of the Premier Motor Car Co., of Los Angeles, has taken over the local Reo agency, and hereafter will handle this car in addition to the Premiers.

Eau Claire, Wis.—The Chippewa Valley Auto Co. has leased the remainder of the large building on River street, which it has been occupying for some time, and is now remodeling it for the purpose.

Milwaukee, Wis.—George W. Browne, 460-464 Milwaukee street, has reduced his line for state distribution and Milwaukee county retailing to the Overland and Marmon and will confine his efforts to these cars for 1912.

Minneapolis, Minn.—On its return to the list of Minneapolis sold cars the Marion makes its home with the new Marion Motor Car Co., 1027 Hennepin avenue. W. A. Crowe is president, W. A. Crowe, Jr., vice-president, and H. A. Crowe secretary-treasurer.

Indianapolis, Ind.—O. H. Pearsall has been appointed general agent for Ideal motor trucks and has established quarters at 44 South Senate avenue, Indianapolis. Until recently Mr. Pearsall was in charge of the motor truck sales of the Indianapolis branch of the Avery Co.

Detroit, Mich.—Announcement is made that Joseph E. Warren has recently become connected with the Metzger Motor Car Co., of Detroit, manufacturer of the Everitt. Mr. Warren will be associated with Sales Manager Hood in the capacity of chief of district managers.

Columbus, O.—The Cummins Auto Sales Co., 153-155 North Fourth street, has taken the central Ohio agency for the Elmore for 1912. The territory includes eighteen counties. Subagents have been contracted for as follows: Cambridge, E. O. Fogle; Thornville, D. S. Spangler.

Boston, Mass.—John D. Murphy, who recently managed the Chicago branch of the Selden until he was taken seriously ill, has recovered and he is now acting as traveling representative of the car for New England, making his headquarters with W. S. Jameson, Boston agent.

New York—The German-made Opel is the latest of the foreign cars to be placed on the market in competition with American-made cars. Irving Stern, a son of Louis Stern, the dry goods merchant, has secured the United States rights for the car, and has installed E. B. Evans as man-

Recent & Incorporations

Paducah, Ky.—Kentucky Auto and Machine Co., capital stock \$5,000; incorporators F. M. Fisher, R. G. Fisher and W. F. Paxton.

Newark, O.—Blair Mfg. Co., capital stock \$300,000; to manufacture motor cars; incorporators Frank M. Blair, John P. McCune, Willis A. Robbins, Edwin C. Wright and Harry H. Baird.

Martinsburg, W. Va.—Norwalk Motor Car Co., capital stock \$300,000; to manufacture and sell motor cars; incorporators F. A. Minor, H. L. Alexander, G. W. McKown and F. A. Minor.

Dayton, O.—Baker Taxicab Co., capital stock \$10,000; incorporator George L. Baker.

Dayton, O.—Acme Carbureter and Mfg. Co., incorporator Charles S. Barkelew.

Nowata, Okla.—Nowata Motor Car Co., capital stock \$2,500; incorporators Walter K. Campbell, George Gordon and Stanley J. Campbell.

Richmond, Va.—Grasberger Vehicle Co., Inc., capital stock \$50,000; to deal in motor cars, wagons, etc.; incorporators J. A. Grasberger, J. E. Sorg and Robert N. Wildbore.

New York—Fear Naught Co., capital stock \$100,000; to manufacture machinery and vehicles; incorporators Richard T. Hughes, John M. Davis and F. G. Munson.

New York—Hudson Export and Import Co., capital stock \$10,000; to manufacture and deal in machinery, engines, motors, etc.; incorporators Herman May, Asher Golden and Meyer Levy.

New York—Osgood Motor Co., capital stock \$10,000; to manufacture and deal in motor vehicles and supplies; incorporators Samuel S. Miskind, Paul W. Smith and Irving J. Joseph.

Elmira, N. Y.—Heater-Muffler Co., capital stock \$50,000; to manufacture appliances for motors, engines, motor cars, etc.; incorporators Wilber Kinzle, Lanson D. Curran and Ansel G. Ingham.

Buffalo, N. Y.—Baker Brothers Motor Co., capital stock \$10,000; to deal in motor cars, etc., incorporators Edward A. Green, Edward H. Baker and Clarence W. Baker.

Newark, N. J.—Merchants Motor Car Co., capital stock \$500,000; to manufacture motor cars; incorporators A. Del Bango, Benjamin Orange and George Hubschmidt.

Lafayette, Ind.—Ross Machine Co., capital stock \$15,000; to manufacture motor car parts; incorporators William Ross, David E. Ross, Linn C. Ross and Edward A. Ross.

Cleveland, O.—Richardson-Neighbors Motor Co., capital stock \$5,000; to sell motor vehicles and accessories; incorporators F. E. Richardson, H. F. Neighbors, W. J. Dawley, Sidney Seidman and Stephen M. Young, Jr.

Peoria, Ill.—Cadillac Auto Co., capital stock \$5,000; to deal in motor cars; incorporators Henry Nauman, H. H. Moody and Rollin Travis.

Memphis, Tenn.—Chickasaw Motor Car Co., capital stock \$25,000; incorporators Carroll P. Cooper, Simpson T. Speers, J. W. Leftwich, N. Hill Martin and R. B. Nebhut.

Memphis, Tenn.—Memphis Motor Co., capital stock \$12,500; incorporators J. T. Fisher, D. M. Armstrong and A. Goodman.

ager, with salesroom at Fifty-second street and Broadway.

Pittsburgh, Pa.—R. P. Sullivan, of the Craig Center Automobile Co., is arranging to handle the Republic car in this city.

Washington, D. C.—The Buick Motor Co.'s branch at 1028 Connecticut avenue, N. W., is being remodeled and enlarged.

Boston, Mass.—The Nance six is a newcomer in Boston motor circles and salesrooms for it have been opened at 94 Massachusetts avenue. It is being handled by the Motor Car Co., recently organized.

Boston, Mass.—C. F. Whitney, who handles the Alco in Boston, and who had the Stoddard-Dayton until a week ago, has vacated the quarters on Commonwealth avenue and has moved down town to Boylston street in Copley square. The United States Motors Co. may sublease the Commonwealth avenue property. The Alco

plans to establish its own branch in Boston.

Pittsburgh, Pa.—The Pittsburgh Mercer Automobile Co. is the new title of the Premier Sales Co., Ltd., which is located at Beatty and Mignonette streets, east end.

Columbus, O.—O. G. Roberts & Co., 933 East Gay street, has closed contracts to handle the Marmon and Overland in nine counties in central Ohio for 1912.

Norwalk, O.—Frank Lamkin, formerly a newspaper man here, has taken a position with the Inter-State Automobile Co., of Muncie, Ind., as advertising manager.

Janesville, Wis.—The garage firm of Reed & Gage, North Main street, will retire from business. Wilson Lane, owner of the building, will continue the business.

Indianapolis, Ind.—H. M. Rickey, formerly with the Henderson Motor Sales Co., in Indianapolis, has taken a position with the W. O. Harlow Co., Yazoo, Miss., which is the agent for the Cole line.

Racine, Wis.—The Racine Automobile and Motor Works has opened a garage and repair shop at 1337 State street. Soren Peterson is president; Jens Mickelson, vice-president; George Gammelgaard, treasurer, and Carl Hyllberg, secretary.

Boston, Mass.—W. Mason Turner, after a vacation of a few months during which he retired from the motor business, has re-entered it again as general manager of the Amplex car. This is the same car for which he had an agency previously and he has secured the old quarters at 261 Dartmouth street.

Los Angeles, Cal.—J. W. Robinson, formerly sales manager with William Gregory, southern California distributor of Moline cars, has severed his connection with the former concern and will now be identified with the Standard Motor Car Co., of Los Angeles, coast distributor for Stoddards and Baker electrics.

Kansas City, Mo.—C. E. Christian, formerly manager of the branches, has taken charge of the Hupmobile branch and has removed to 3013 Main street. The Hupp-Yeats electric branch has removed to quarters formerly occupied by the Detroit electric branch at 3501 Main street. W. N. McWade, of Detroit, is the manager.

Columbus, O.—The Reliance Truck and Garage Co., 111 East Lynn street, has closed contracts to handle all of the lines of the General Motors Truck Co., which will include electrics and gasoline trucks and delivery wagons. George Bohn is general manager. The territory consists of twenty-three counties in central Ohio.

Portland, Ore.—C. B. Clements, formerly with the Howard Automobile Co., of Portland, and later traveling representative of the Goodyear Tire and Rubber Co., has resigned his position with the latter firm and will engage in the motor car business in Grants Pass, Ore. He has secured the agency for the Buick and National cars in Josephine county, Ore.